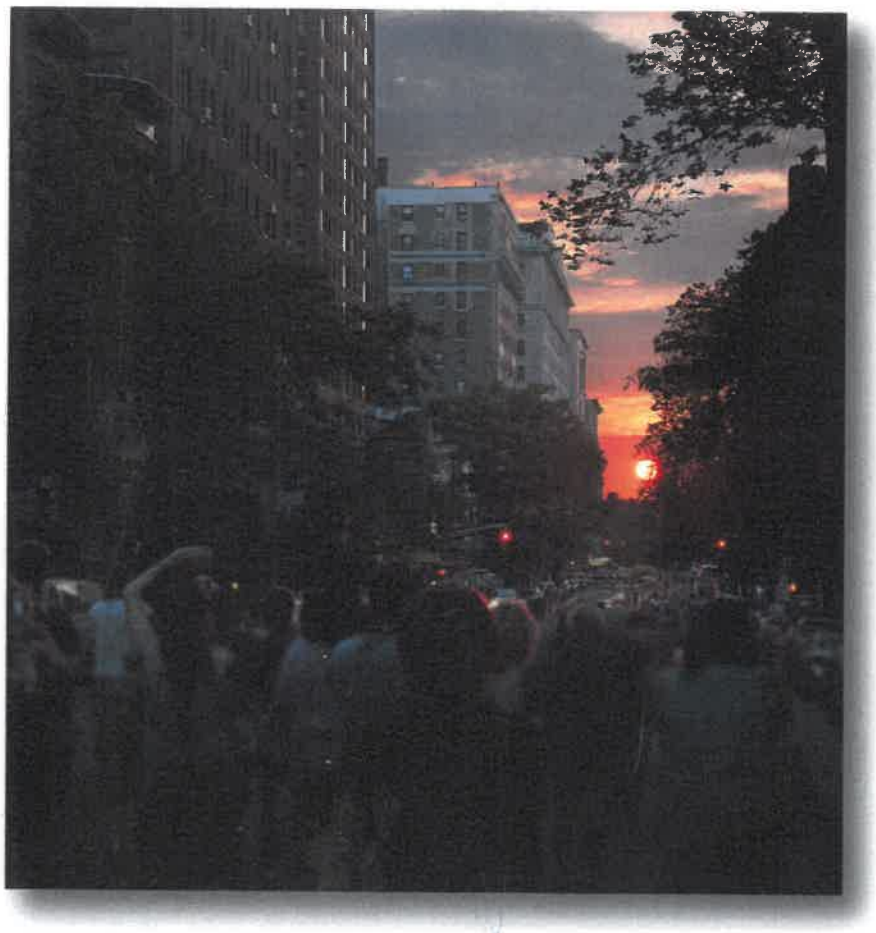
ASTRONOMICAL SOCIETY OF THE PACIFIC
CONFERENCE SERIES

VOLUME 501

INSPIRATION OF ASTRONOMICAL PHENOMENA VIII: CITY OF STARS



Edited by
Brian Patrick Abbott

Inspiration of Astronomical Phenomena VIII: City of Stars
ASP Conference Series, Vol. 501
Brian Patrick Abbott, ed.

Cosmological Symbolism in the Decorative Cycles of Mid-Byzantine Churches

Valerie Shrimplin

Gresham College, London, United Kingdom; vshrimplin@gmail.com

Abstract. Fundamental links between theology and astronomy are widely reflected in the Judaeo-Christian tradition. From Genesis to Revelation, the great mysteries of the beginning and end of the universe, and the cycles of birth and death of individuals, are explained in terms of cosmological concepts. These are in turn reflected in art and architecture and nowhere more broadly, perhaps, than in Byzantine architecture and decoration. Following the Iconoclast prohibition of images in the Orthodox church (726–843), the mid-Byzantine period (843–1204) witnessed the primacy of the representation of the heavens in art and architecture. Reinforced by such writers as Cosmas Indicopleustes and Pseudo-Dionysius the Areopagite, not only were individual images reflective of the heavens (nativity and rebirth at the winter solstice, and rebirth/resurrection at the spring equinox) but entire cycles of church decoration were devised so as to reflect the ordering of God's universe. The architecture and decoration of the quintessential mid-Byzantine cross-in-square church was symbolic itself of the universe, as at Hosios Loukas and Daphni (eleventh century). From the location of the *Pantocrator* in the central celestial dome, to the descending zones of squinches and pendentives and the lowest earthly zones, decorative schemes are used to reflect the view of the sky/heavens above earth. Hierarchical systems depicting the life of Christ and ascending/descending ranks of saints and angels were rigorously adhered to, with Mary in the apse as bridge between heaven and earth.

1. Greek and Byzantine Cosmology

The Mediterranean climate, with clear skies and vistas by night and by day make it impossible in Greece not to be conscious of the heavens, the horizon, celestial phenomena, and the surrounding cosmos. In contrast to northern climes, endless blue skies by day and the dome of stars by night make contemplation of the universe an inevitability. From Homeric times to classical Greece, perceptions and observations of the skies and astronomy permeated everyday life, from the changing seasons to links with the deities and forces that moved the cosmos. Epic, narrative, and scientific texts relating to Greek astronomy from classical times are well known, but the same themes apply to the Byzantine era (313–1453 AD), which is often overlooked due to a lack of understanding, and even criticism, of the Byzantine epoch in the West. This was promoted from the time of the split between Eastern and Western Churches in 1054 AD, and, with regard to artistic achievement, particularly during and after the Renaissance period when it was criticized by Vasari and others for lack of naturalism. Vasari (1971) comments on "the dead tradition of the Greeks ... paintings and mosaics covered with heavy lines and contours ... their crude stiff and mediocre style," not appreciating the symbolic and abstract approach, but criticizing artists for not making their art "softer

and more realistic and flowing," something that they were clearly not trying to do. Byzantine art should actually be regarded as abstract-symbolic and, as such, it is very closely linked to the perception of the cosmos (as reflected in art and architecture).

2. Links Between Theology and Astronomy

Fundamental links between theology and astronomy are widely reflected in the Judaeo-Christian tradition. From Genesis to Revelation, the great mysteries of the beginning and end of the universe, and the cycles of birth and death of individuals, are explained in terms of cosmological concepts. The key issues—What is the universe? How does it work? Where are we in it?—have been widely examined by scientists and thinkers but also reflected in art and architecture. Byzantine architecture and decoration can lay claim to being amongst the foremost of these. The heavens have shaped spiritual and religious thinking with the result that they have been interpreted and exploited in art and architecture in order to convey the great tenets of orthodox religious thought. The Byzantine view of the cosmological ordering of the universe is first and foremost derived from the scriptures, but first it would be helpful to pause to consider the importance and extent of the Byzantine Empire itself—a vast area that is often overlooked in the story of Europe (which focuses on the West). The significance of the Empire is clear—especially at the time of the death of the Emperor Basil II in 1025, when it reached its greatest extent.

3. Cosmological Concepts from Genesis to Revelation

From the opening descriptions in Genesis I of "the beginning" to the analysis in the book of Revelation of "the end," innumerable texts lay out the Judaeo-Christian (and Orthodox) view of the universe.

The fundamental concept of the flat earth covered by the dome of heaven is derived from Isaiah 40:22, where God is described as the creator "who sitteth upon the circle of the earth" and "stretcheth out the heavens as a curtain and spreadeth them out as a tent to dwell in" (see Psalm 104, Jeremiah 10:12). These provide the main sources for the view of the universe as a flat earth covered by the dome of heaven, from which much of the Judaeo-Christian tradition of church building is derived. This is clearly linked with the basic idea of the directional "up for heaven" and "down for hell" view in which the good are rewarded and the bad punished after their earthly existences. Byzantine art and architecture in turn aims to reflect such concepts, reinforcing the overall messages as well as creating an otherworldly atmosphere in a highly decorated architecture. Unlike Western church architecture where buildings are embellished with symbolic and especially narrative scenes on the exterior, Byzantine churches intentionally have rather somber exteriors in order to emphasize the transition into heavenly realms as the congregation enter within. The typical Byzantine domed church thus aims, overall, to be imitative of the flat earth covered by the dome of heaven whilst the rich mosaic-covered interiors convey the spectator to another heavenly world.

4. The Byzantine View of the Cosmos

Such concepts, laid out in the scriptures, were reinforced and reinterpreted over time, being further examined in various writings, of which the works of Pseudo-Dionysius the Areopagite (early sixth century) and the *Christian Topography* of Cosmas Indicopleustes (seventh century) are but two examples. Not only were individual images reflective of the heavens as represented in art, but entire cycles of church decoration were devised so as to reflect the ordering of God's universe. The scriptural concept of the flat earth surmounted by the heavens, with hell beneath the earth's surface, had an immense influence on mid-Byzantine architecture and decoration. In this way, the ordering of the architecture and decoration of the quintessential mid-Byzantine church was symbolic itself of the universe. An effective shorthand of this schema or arrangement can be found in the *Christian Topography* of Cosmas Indicopleustes.[1] This clearly corresponds to the concept of the flat earth—the drawing of the universe is shaped somewhat like an antique traveling trunk (see Figure 1). This corresponds to the shape of the Holy Tabernacle (Exodus 25–27) which was rectangular and twice as long as it was wide, the earth being held to be the same shape.

Cosmas dismisses the ancient theory (of which he was surely aware) that earth might be spherical, regaling the concept as ludicrous—for surely then rain would fall upwards in the southern hemisphere.

The correlation between the perception of the cosmos and church architecture is apparent. Similarly, in Cosmas's drawings of the universe in cross section, the dome of heaven is evident and there is also an immediate and obvious correlation between this diagram, showing the universe in cross section, with the layers of celestial and terrestrial realms (Shrimplin 2000; Lehmann 1971). This approach was taken in a great deal of early Byzantine architecture, for example St. Sofia, Constantinople (constructed 532–537), where the approach is clearly linked to the Dome of Heaven—with its "hanging architecture approach." The Dome is also emphasized at this time, for example, in the Church of Hosios David (late fifth century) in Thessaloniki, part of a former monastic complex.

5. Reflection of Cosmology in Mid-Byzantine Art and Architecture

Following the period of iconoclasm when visual images were prohibited in the Eastern Orthodox church (726–843), cosmological themes reached their height in the Middle Byzantine period (843–1204). Art and architecture were used to reinforce dogma and heighten theological and cosmological concepts at a time when it was difficult to think in such abstract terms. This contrasted with the narrative approach of Western art and architecture based on the use of church art and architecture in a narrative way as "the Bible of the illiterate." The typical structure of the mid-Byzantine, domed, Greek cross-in-square church is related to the concept of natural eye observation of the universe. It

[1]Illustrative material relating to this paper is widely available on the internet. Images from the *Christian Topography* of Cosmas Indicopleustes are available via an image search on "cosmas indicopleustes christian topography."

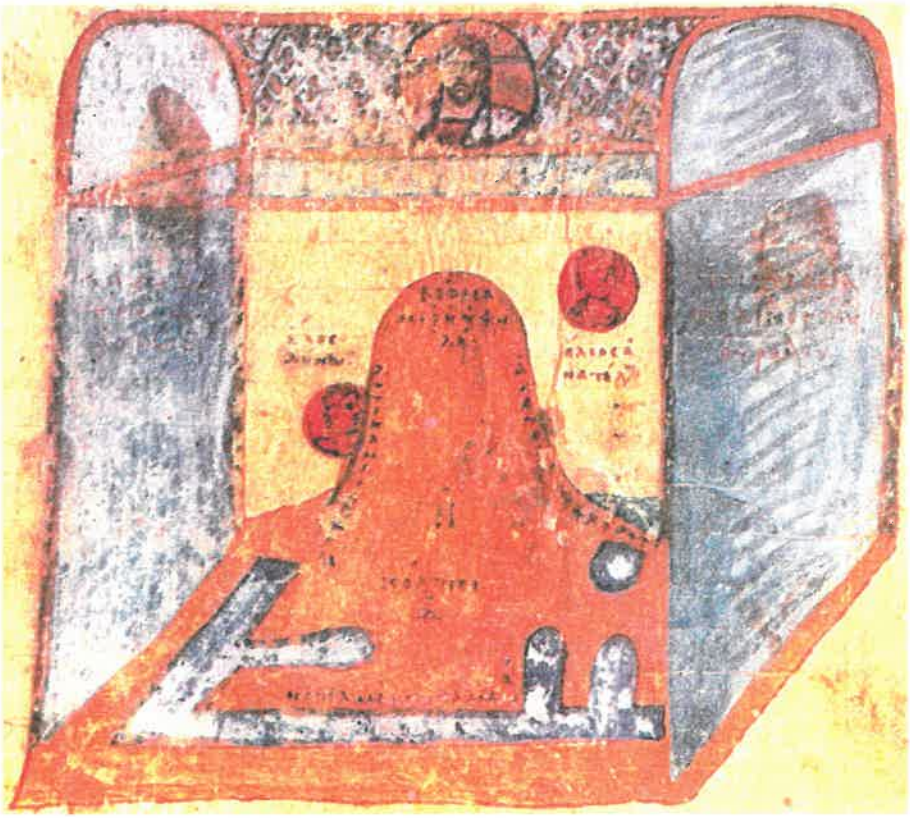


Figure 1. Diagram of the universe, after the *Christian Topography* of Cosmas Indicopleustes, seventh century. (Belser Verlag, Stuttgart)

can be examined by focusing on two leading examples of the period: the monastery of Hosios Loukas in Phocis, Greece and the monastery at Daphni, near Athens.[2]

The design of the Greek "cross-in-square" church focuses on the ancient Greek mathematical attempt to "square the circle" by placing a circular dome on the square cross piece created by the crossing of the arms of the church (the arms generally being of equal length, in contrast to the elongated naves and shorter transepts of Western churches). As mentioned, the exteriors are plain, rather than decorated with narrative scenes (often sculptural) as in the West. Inside, however, the entire church and its decoration is divided into specific zones that correlate with the areas of the universe. As Demus points out, "They were not created as independent pictures. Their relation to each other, to their architectural framework, and to the beholder must have been a principal concern of their creators" (Demus 1953).

---

[2]For illustrative material on Daphni, see `http://www.ellopos.net/gallery/daphni-gallery/default.asp`

Figure 2. The monastery of Hosios Loukas, Phocis, Greece. (Sogal, Wikimedia Commons)

6. The Monastery of Hosios Loukas

The best examples of traditionally decorated schemes were the great mid-Byzantine monasteries, exemplified by Hosios Loukas (first half of the eleventh century), Daphni (mid-eleventh century), and the Nea Moni at Chios (late eleventh century). All of these (and many others) conformed to the standardized systems of Byzantine iconography. By the time Hosios Loukas was built, the Byzantine view of the cosmos had become more sophisticated than in the time of Cosmas, but the approach was fundamentally the same. Byzantine architecture is basically conceived as a "hanging architecture" as the various realms descend from the Dome of Heaven itself. This contrasts with a significantly different approach in the West where, for example, the architecture aspires to reach upwards and heavenwards—as with the vertical emphasis of soaring Gothic vaults and towers. In Byzantine architecture, together with its corresponding iconography and decoration, the layout is basically divided into three zones. The uppermost zone is reserved for events taking place or located in heaven itself. Hence the main dome is reserved for the *Pantocrator* as all-powerful cosmic deity rather than the "Lamb" of the New Testament, as demonstrated by the *Pantocrator* at Daphni, or the

Descent of Holy Ghost to the apostles at Hosios Loukas (Demus 1953; Krautheimer 1965).

Descending from the point of location of the *Pantocrator* in the central celestial dome, the iconography of the middle zone of apses, squinches, and pendentives (arched and curved spaces used to enable the placing of circular domes on square buildings) represents the next layers in the hierarchy of the descending zones of heaven. Scriptural images and figures organized and reflected in their position in the great scheme of things (Lovejoy 1936; Koestler 1984). Mary, Mother of Christ, is depicted in the apse, as the bridge between heaven and earth. The emphasis here is on the Festival cycle where the key festivals of the Orthodox calendar year are organized, not according to the chronological narrative of Christ's life (as in the Western tradition) but in accordance with the occurrence of the Festivals during the year. Decorative cycles were not only dependent on hierarchical schemes analogous to the ordering of God's universe, but also to the liturgical year. The life of Christ is not depicted in a chronological or narrative sequence, as is more common in the West, but in accordance with the associated astronomical events, such as birth and new life at the winter solstice (*Nativity*, 25 December), and rebirth at the spring equinox (*Crucifixion* followed by *Resurrection*).

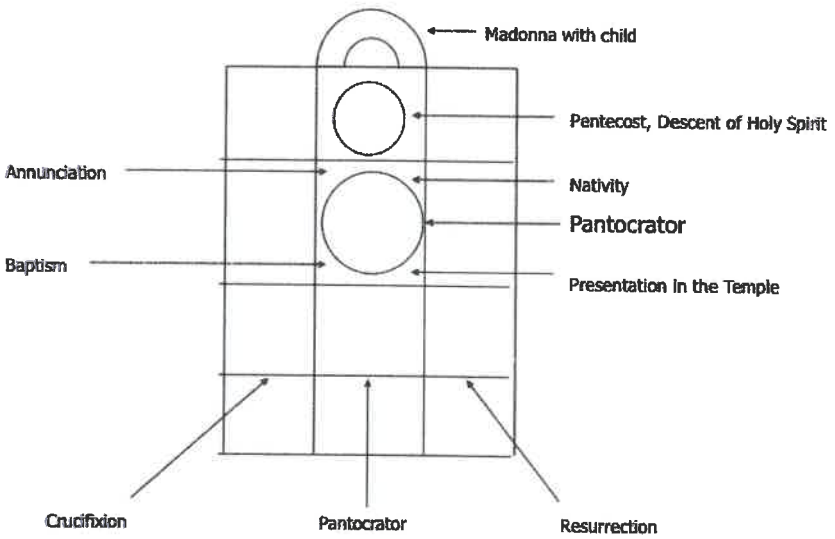


Figure 3. Diagram of the Festival Cycle. (Valerie Shrimplin)

The cycle of mosaics at Hosios Loukas clearly demonstrates this, as the order is *Annunciation* (25 March), *Crucifixion* (April—full moon after the spring equinox), *Anastasis/Ascension* (forty days after Easter), *Pentecost* (fifty days after Easter), *Nativity* (25 December, winter solstice), *Baptism* (celebrated at the *Epiphany*, 6 January), *Epiphany* or the visit of the kings (6 January), *Presentation in the Temple* (2 February)

and so on, according to the feast days rather than the chronology of the life of Christ. The recurring cycle reflects the eternal motions of the heavens as proof of the existence of the heavenly realm, rather than aiming at a narrative of events. The illusion of space is also not attempted, but rather the use of the real physical space of the church.

Finally, the lower earthly zones are reserved for lesser saints and prophets, according to the hierarchy, which is dependent on the cosmological view of the universe in its hierarchical arrangements. Thus, the church as an entity is used as a means of reflecting the view of the sky and heavens situated above the earthly regions. Hierarchical systems, depicting Christ and the saints and angels were rigorously adhered to and the approach to space is also significant. Real space is used for the mosaics at Hosios Loukas as the figures relate not only to the beholder, but to each other in real space as they simultaneously face the beholder and each other across the apses and squinches (*Baptism*, etc.). Concepts of infinity in the golden abstract backgrounds are also indicated, as in the *Crucifixion* (Ouspensky 1980).[3] Mosaicists were not interested in the depiction of lifelike figures in real space, but in a symbolic approach that related to much higher concepts concerned with the cosmos.

Figure 4. Hosios Loukas, *Nativity*. (Jan Housen, Wikimedia Commons)

In individual scenes also, cosmic concepts of infinity and eternity are explored through the depiction of abstract gold backgrounds, without limit. Individual astronomical elements are also much in evidence. The sun and moon feature in *Crucifixion* scenes for example, and are used to emphasize the cosmic nature of Christ's sacrifice.

[3]The theory of the icon is best explained in Ouspensky. Space does not allow further discussion here of the way in which the icon symbolizes that which it represents. Reverence or worship is not paid to the icon but to the personage represented, much as a modern flag represents and symbolises the state.

Stars and celestial vaults are also included, even if somewhat abstracted and stylized (see Figure 4). Regaled by Vasari and others in the West as "crude, stiff and mediocre" (Vasari 1971) and for being unable to depict three dimensional space, Byzantine artists should hardly be criticized for not doing what they were not intending to do. Would Picasso be criticized for not depicting naturalistic space? The Byzantine approach should similarly be viewed as an abstract interpretation of the cosmos.

7. The Monastery of Daphni, Athens

In the church at Daphni, slightly later than the mosaics at Hosios Loukas, the same principles apply. The awesome *Pantocrator* in the dome dominates the internal space and the central and lower zones are also arranged in the same way so as to emphasize the "otherworldliness" of the interior of the church and its function as a reflection of God's ordering of the universe. A comparison between the two main domes at Hosios Loukas and Daphni demonstrates the liturgical approach and the fixed positions used for images.

8. The Continuing Tradition: Later Examples

The cosmological tradition is also evident in later works, for example the Nea Moni of Chios, and also at St. Saviour in Chora, Constantinople (now known as the Karie Djami), where the rolling out of the heavens is clearly depicted in accordance with the biblical text, "And the heaven departed as a scroll when it is rolled together" (Revelation 6:14).[4] The Byzantine tradition of cosmological church architecture and decoration was at its height in the mid-Byzantine period but it continued to play a part in subsequent centuries. The influence of Byzantine theories and principles is evident in the West. For example, the traditional links between ecclesiastical art and architecture established in Byzantine art were also influential in Italo-Byzantine works in Ravenna (particularly St. Vitale, where the sphere of the universe is depicted in the apse), also Monreale and St. Mark's in Venice.

These ideas traveled thence to influence Giotto's star-covered ceiling in the Arena chapel and then to underlie the Renaissance tradition of domes and vaulted architecture, which is a foundation for much of Western architecture. In spite of the very different approach to space and realism in the Renaissance, certain influences can be seen, such as the revival of domed churches. Indeed, it was partly the dispersal of great Greek thinkers after the taking of Constantinople by the Ottoman Turks in 1453 that was to precipitate the Renaissance. It might even be claimed as underlying some of the Renaissance approach—such as the Sistine Chapel, which is built in the same proportions as the universe (like Cosmas's "traveling trunk") and originally with a star-covered

[4]It is important to remember that during the Middle Ages, there were frequent exchanges of work in Byzantine and Islamic scientific circles. The Byzantine Empire initially provided the medieval Islamic world with Ancient and early medieval Greek texts on astronomy, mathematics, and philosophy for translation into Arabic since the Byzantine Empire was a leading center of scientific scholarship at the beginning of the Middle Ages. Later, as medieval Islamic cultures became centers for scientific knowledge, Byzantine scientists such as Gregory Choniades, visited Muslim observatories and translated books on Islamic astronomy, mathematics, and science into medieval Greek. Byzantine scientists also became acquainted with Sassanid and Indian astronomy through various Arabic texts.

vault (and redecorated later with Michelangelo's own cosmic vault) (Shrimplin 2000). There are many later examples of cosmological influences on Byzantine art, such as artifacts and altarpieces. The nineteenth century church of St. Sophia, in Moscow Road, Bayswater, London still reflects similar themes and iconography.

9. Rethinking Byzantine Art and Architecture

Consideration of Byzantine art as an expression of the view of the universe demonstrates the cosmological approach. The aim was spiritual and inspirational—addressing the great questions of life and death, and mankind's place in the universe. The "otherworldly" and spiritual aspects were intended for monastic communities, rather than as "stories" for the laity, as in the medieval West. Church architecture was firmly based on the cycles of the universe, which was based on circular movement (not simply directional towards the altar, as in the West). Flat earth cosmology reflecting an "up for heaven/down for hell" approach was combined with individual features (stars, sun, moon, and sky), helping to shape religion and, hence, society and identity. As stated at the 7th Ecumenical Synod (2nd Nicaea) in 787 when images were restored to use, "Art belongs to the artists but the disposition of it is the prerogative of the Holy Fathers." A cosmological view of the universe was fundamental to the hierarchical systems in Byzantine Art, centred on abstract theology and attempts to understand cosmology and a particular world view.

Acknowledgments. This paper was previously delivered under the title "Astronomy and Cosmology in Byzantine Art: Bringing Byzantine Art into the twenty-first Century," at the Conference on Heavenly Discourses held at the University of Bristol, England 14–16 October 2011. Thanks are due to the INSAP VIII organizing committee, particularly Brian Abbott, for permitting me to deliver a variation of the paper again on the grounds that it is a very different audience in a very different location.

References

Demus, O. 1953, Byzantine Mosaic Decoration: Aspects of Monumental Art in Byzantium (London: Routledge and Kegan Paul)

Koestler, A. 1984, The Sleepwalkers: A History of Man's Changing Vision of the Universe (Harmondsworth: Penguin)

Krautheimer, R. 1965, Early Christian and Byzantine Art (Harmondsworth: Penguin)

Lehmann, K. 1971, in Modern Perspectives in Western Art History, edited by W. E. Kleinbauer (New York: Holt, Rinehart and Winston)

Lovejoy, A. O. 1936, The Great Chain of Being (Cambridge: Harvard University Press)

Ouspensky, L. 1980, La Théologie de l'icône dans l'Église orthodoxe (Paris: Editions du Cerf)

Shrimplin, V. 2000, Sun-symbolism and Cosmology in Michelangelo's Last Judgment (Kirksville, MO: Truman State University Press)

Vasari, G. 1971, Lives of the Artists (Harmondsworth: Penguin)