

Dumbarton Oaks Research Library and Collection
Byzantine Studies Symposium
April 20–21, 2018

The Diagram Paradigm: Byzantium, the Islamic World, and the Latin West

Symposiarchs: Jeffrey Hamburger, David Roxburgh, and Linda Safran

FRIDAY, APRIL 20, 2018

8:30–9:00 a.m. Registration and Morning Coffee

9:00–9:10 Welcome by Jan Ziolkowski, Dumbarton Oaks

INTRODUCTIONS

Chair: Ruth Macrides, University of Birmingham

9:10–9:30 Byzantine Diagrams
Linda Safran, Pontifical Institute of Mediaeval Studies

9:30–9:50 Islamic Diagrams
David Roxburgh, Harvard University

9:50–10:10 Western Medieval Diagrams
Jeffrey Hamburger, Harvard University

10:10–10:30 Coffee Break

DIAGRAMMING SCIENCE

Chair: John Duffy, Harvard University

10:30–11:05 Between Diagram and Image: On Jubal's Lyre
Benjamin Anderson, Cornell University

11:05–11:40 Byzantine-Islamic Scientific Culture in the Astronomical
Diagrams of Chionides on John of Damascus
Alexandre Roberts, Columbia University

11:40–12:10 p.m. Discussion

12:10–2:00 Lunch in the Orangery

DIAGRAMMING NUMBERS AND LETTERS

Chair: Ioli Kalavrezou, Harvard University

- 2:00–2:35 Diagrams and *Denumeratio*: Engendering a Numerate Eye in Medieval Europe
Megan McNamee, Center for Advanced Study in the Visual Arts, Washington, DC
- 2:35–3:10 Diagramming the Diagrammatic in Twelfth-Century Europe
Adam S. Cohen, University of Toronto
- 3:10–3:40 Coffee Break
- 3:40–4:15 Illustrations or Diagrams? Figures in Medieval Arabic and Persian Calligraphic Treatises
Nourane Ben Azzouna, Université de Strasbourg
- 4:15–5:00 Discussion
- 5:00–7:00 Reception in the Orangery

SATURDAY, APRIL 21, 2018

9:30–10:00 a.m. Registration and Morning Coffee

DIAGRAMMING COSMOLOGY

Chair: Dimiter Angelov, Harvard University

- 10:00–10:35 Concentric Celestial Spheres and Their Visual Representations in the Twelfth and Early Thirteenth Centuries
Barbara Obrist, CNRS, Paris
- 10:35–11:10 A World of Embedded Spheres: Cosmological Diagrams in Late Byzantine Manuscripts (12th–15th Centuries)
Anne-Laurence Caudano, University of Winnipeg
- 11:10–11:30 Coffee Break
- 11:30–12:00 p.m. Discussion

12:00–2:00 Lunch in the Orangery

DIAGRAMMING THEOLOGY AND PHILOSOPHY

Chair: Derek Krueger, University of North Carolina, Greensboro

2:00–2:35 The Prophet Muhammad’s ‘Ayn Seal: A Safavid-Period Diagram
as Cosmic Catharsis
Christiane Gruber, University of Michigan

2:35–3:10 Diagrams in Byzantine Philosophical Manuscripts: Plato,
Aristotle, and Their Commentators
Lutz Koch, Berlin-Brandenburgische Akademie der Wissenschaften

3:10–3:30 Coffee Break

3:30–4:00 Discussion

CONCLUSION

Chair: Robert Ousterhout, University of Pennsylvania

4:00–4:30 Response to the Papers
Jeffrey Hamburger, Harvard University

4:30–5:00 General Discussion

The Diagram Paradigm: Byzantium, the Islamic World, and the Latin West

Symposiarchs: Jeffrey Hamburger, David Roxburgh, and Linda Safran

ABSTRACTS

Between Diagram and Image: On Jubal's Lyre

Benjamin Anderson, Cornell University

Manuel Bryennios's *Harmonika* II.7 (composed ca. 1300) describes a diagram—after the fashion of a geometric construction—to illustrate the “fifteen strings of what is called by the Canonists the Changeless Tone-System, which comprises all the harmonious ratios” (tr. Jonker). The diagram has been faithfully executed in multiple manuscript copies of the treatise (e.g., BnF gr. 2461, fol. 39r, 14th c.). The same diagram, with the same labels and sequence of points, underlies a full-page miniature in the “fascicoli aggiunti” of Venice, Marc. gr. Z 516 (fol. 141v, 14th c.). This rendition does not appear in the discursive context of a treatise, however, but as the last in a series of four similarly themed sides of a discrete bifolio (“le miniature musicali”). It has furthermore been rendered as a stringed instrument whose tuning pegs (twelve instead of fifteen) are capped by the signs of the zodiac. Above the three unpegged strings at the center kneels a figure labeled “Ioubal,” the biblical inventor of music (Gen. 4:21), who holds an instrument of his own. Parallels between the strings of a lyre and the heavenly bodies are known both to Bryennios (*Harmonika* I.1) and within the “miniature musicali” (fol. 140v), but they invariably invoke the planets, not the fixed stars. Therefore, the addition of the twelve signs does not result in a compound diagram based on a recognized theory of correspondences; rather, it serves to lend the drawing heft. Similarly, although Bryennios attributes certain of his theories to recognized authorities (Pythagoras and Hermes, for example), the introduction of a biblical frame is unique to Marc. gr. Z 516. The comparison of the two folios accordingly invites assessment of systematic distinctions between diagram and image, discourse and narrative.

Illustrations or Diagrams?

Figures in Medieval Arabic and Persian Calligraphic Treatises

Nourane Ben Azzouna, Université de Strasbourg

In the Islamic world, calligraphy is the art that gave rise to the richest specialized literature, consisting of about 150 texts written between the eighth and the nineteenth centuries. Some of these texts are “illustrated” with graphic representations of letters, but these “illustrations” have never been the subject of a comprehensive reflection. My paper proposes to explore this material, which raises numerous questions. Which texts are illustrated and why were they illustrated? How did these illustrations come down to us, through one or several manuscripts? When a text is only known through a nonautograph and, especially, a noncontemporary manuscript, what is the status of its figures? How should they be interpreted and used? Generally speaking, there seems to be a distance between the text and the figures. In this case, are the latter faithful illustrations or schematic diagrams? And what is their main utility?

**A World of Embedded Spheres:
Cosmological Diagrams in Late Byzantine Manuscripts (12th–15th Centuries)**

Anne-Laurence Caudano, University of Winnipeg

According to the most widespread Byzantine understanding of the layout of the cosmos, the world was composed of eight or nine embedded celestial spheres centered on the earth. Diagrams reproducing these concentric circles with the central earth provided an effective introduction to the spherical model of the universe, but in the Komnenian and Palaiologan periods such diagrams are rarely present in the manuscripts that contain the most important astronomical and cosmological manuals (such as Cleomedes or Geminus). Even the manuscripts of Proclus's *Hypotyposis*, with their various astronomical figures, do not include the basic diagram of the cosmos. In astronomy, two copies of Theon's *Short Commentary to the Handy Tables* reproduce this diagram, but in both cases it is rejected at the end of the tables and presumably only included because there was still some space to do so. It seems that these diagrams were not needed for more advanced students and scholars. They do appear in works of other disciplines, however, such as medicine and music. They are also attached to much simpler—often anonymous—introductions to the world and its parts. In these cases, the diagrams allowed the copyist (or the author) to avoid lengthy explanations about the layout of the universe. Sometimes they were also used to contradict or add to the text and, as such, they provided a visual gloss. On the whole, the presence or absence of these diagrams in manuscripts raises interesting questions about the place of cosmology in Byzantine education.

Diagramming the Diagrammatic in Twelfth-Century Europe

Adam S. Cohen, University of Toronto

This paper grapples with the perennial problem of how to define the Western medieval diagram by examining a range of examples in twelfth-century manuscript illumination and proposing a diagram as a way to think usefully about the spectrum of diagrammatic phenomena. Doing so allows for a more nuanced appreciation of the types and functions of different kinds of diagrams and diagrammatic schemata. Lambert's *Liber Floridus*, Herrad's *Hortus Deliciarum*, and the ark described in Hugh of Saint-Victor's *De arve Noe* contain the diagrammatic material for which the twelfth century is well known, but a consideration of other, lesser-known works further fleshes out our view of this important period in the history of the medieval diagram. In this regard, the twelfth century emerges as a period that is both remarkably innovative and deeply conservative, as traditional religious thinkers confronted new intellectual challenges in part through the medium of visual apparatuses.

**The Prophet Muhammad's 'Ayn Seal:
A Safavid-Period Diagram as Cosmic Catharsis**

Christiane Gruber, University of Michigan

This paper explores a large-scale diagram, measuring 72 x 48.8 cm, most likely made in Iran during the seventeenth century. It is held in a private collection in London and remains unstudied. Among its graphic and textual contents, it depicts the "seal of the Prophet" in the shape of the letter 'ayn, which means both "eye" and "spring." These sphragistic and lettrist motifs are indebted to earlier Islamic hermetic traditions, including "cosmic order" (*ba'ya*) maps and mystical-letter (*burujfi*) diagrams, such as those articulated by the "Brethren of Purity," al-Buni, and al-Bistami. However, in

this particular instance the diagram has been expanded in size and visual content. It includes verses by the Persian Sufi poet Sa‘di (d. 1291) and by Mir Damad (d. 1632), the latter quoted on the mystical meanings of the letters *nun* (the *n* of creation) and *‘ayn* (the spring of life). The citation of Mir Damad proves of special interest, as this Safavid gnostic philosopher, well known as the founder of the “School of Isfahan,” believed that the pondering of abstract concepts could activate spiritual visions. This was perhaps the purpose of this made-for-display diagram, which also encourages mystics to engage in the weekly activities of invocation, fasting, silence, vigil, segregation, cogitation, and repentance. Last but not least, this cosmic seal diagram also associates the four bodily humors (heat, cold, dryness, and wetness) with ‘Ali, Fatima, Husayn, and Hasan, respectively. Blending letterist philosophy, occult cosmology, Sufi poetics, and Shi‘i-inflected humor theory, this epistemic image invites its spiritualist beholders to imagine visually and thus access the secrets of God and the cosmos, in the process strengthening the particular beliefs of a Safavid Shi‘i-Sufi brotherhood at a moment of increasing sectarianism across Islamic lands.

Diagrams in Byzantine Philosophical Manuscripts: Plato, Aristotle, and Their Commentators

Lutz Koch, Berlin-Brandenburgische Akademie der Wissenschaften

Philosophy of the classical period was closely related to mathematics and the sciences; mathematical reasoning provided models and procedures for philosophical theories, for example, in epistemology. Paramathematical passages and *more-geometrico* arguments also reflect the origin of foundational philosophical texts in the learned discussions and educational practices of their time. In later antiquity, the canonized works of Plato and Aristotle were subject to exegesis within a highly standardized scheme of education and spiritual formation. The most prominent commentaries became canonical works themselves, thus providing the framework for technical “philosophy” in the conservative book culture of the Byzantine era. This presentation takes a closer look at the stock of philosophical diagrams in important manuscripts of the Platonic and Aristotelian traditions, focusing on codices of the early period (ninth and tenth centuries), which channel the ancient tradition and set the stage for its later transmission and transformation. Examples of both commonplace and more emblematic diagrams (primarily taken from natural philosophy) are discussed with a view to their functions and sources and to the peculiarities and occasional pitfalls of implementing them in books of varying formats designed for different purposes and audiences.

Diagrams and *Denumeratio*: Engendering a Numerate Eye in Medieval Europe

Megan McNamee, Center for Advanced Study in the Visual Arts, Washington, DC

Creation was understood in the Middle Ages to have been the act of a numerate god who made all things in “measure, number, and weight.” The order that underlay the universe governed the works of man as well. The influential Augustine of Hippo stated as much: “Craftsmen have numbers in their craft which they apply to their works.” For Augustine, mathematical and artistic form was enmeshed, order and beauty intertwined: “Whatever delights you in a body and entices your bodily senses is full of number.” Here, the frisson of aesthetic pleasure arises from denumeration (derived from Lat. *denumeratio*), meaning “to discover number, count, or calculate.” This paper fleshes out the notion of *denumeratio*. Now obscure, the term was common in the Middle Ages; its recuperation is, I hold, key to comprehending the era’s preference for diagrammatic modes of depiction. Significantly,

it appeared in Plato's *Timaeus*, a dialogue that undergirded all scientific speculation. Plato called the eyes a divine gift and claimed that the supreme good of vision was the ability to denumerate. This number-knowing capacity was cultivated in monastic and cathedral schools through the quadrivium: arithmetic, geometry, music, and astronomy. Diagrams were essential to that effort. Focusing on the tenth and eleventh centuries—a period that witnessed an uptick in quadrivial study—and drawing examples from Boethius's *De arithmetica*, I demonstrate how formulae and *descriptions* sensitized the eye to quantity, sequence, shape, and proportion, and consider the sensual aspects of such abstractions.

Concentric Celestial Spheres and Their Visual Representations in the Twelfth and Early Thirteenth Centuries

Barbara Obrist, CNRS, Paris

During the so-called twelfth-century Renaissance, the predominantly Platonic, Roman model of the physical universe, which included eight concentric celestial spheres, was gradually superseded by differing cosmological models. In these, the sphere of the fixed stars no longer delimited the universe but was surrounded by a ninth and sometimes also a tenth sphere, either for astronomical or physical reasons. Moreover, metaphysical and theological perspectives also led to the acceptance of supplementary spheres, including those of a spiritual nature. While all these models were put forth in the twelfth century, it was only in the first half of the thirteenth century that there emerged a certain consensus concerning the number of heavenly spheres: nine. Before the twelfth century, the generally accepted idea of an eight-sphere heaven was indicated by standard visual figures consisting of eight concentric bands laid out around the central earth. What were the different stages leading up to the thirteenth-century conception of a nine-sphere heaven, and to what extent were these stages represented by corresponding visual figures? What was the function of these visual figures? In the thirteenth century, did visual expressions of what might be termed a new *imago mundi* come to dominate? Relying on the same analytical categories as those used in my earlier study on the introduction of *infernus* in twelfth-century cosmology, this contribution compares treatises of early twelfth-century authors to those by such thirteenth-century authors as John of Sacrobosco, Robert Grosseteste, and Albert the Great.

Byzantine-Islamic Scientific Culture in the Astronomical Diagrams of Chioniades on John of Damascus

Alexandre M. Roberts, Columbia University

The Byzantine astronomer and physician George-Gregory Chioniades (d. ca. 1320) had close ties to Muslim scientists, for he went often to the lands of “the Persians, Chaldeans, and Arabs,” most famously to Tabriz, a major scientific center, where he studied astronomy. He would later become bishop of Tabriz. In this paper, I examine precious evidence for this Byzantine-Islamic cultural and intellectual contact: the diagrams and annotations that, in about 1301, Chioniades supplied in his own hand in the margins of a copy of John of Damascus's *Dialectica* and *Exposition of the Orthodox Faith* (parts 1 and 3 of his extremely popular trilogy, the *Fountain of Wisdom*). I focus on a series of astronomical diagrams that use many Arabic astronomical terms, demonstrating their close relationship to the patristic Christian text they accompany and to Chioniades's other marginal annotations and diagrams. Throughout the manuscript, Chioniades uses diagrams to clarify,

interpret, and illustrate the Damascene's philosophical discussion. Chioniades's astronomical diagrams accompany the chapter on heavenly bodies, providing elementary information one would need to begin studying astrology. He makes this link to astrology all but explicit in his annotations, which detail the powers of each planet and zodiac sign and elaborate upon the distinction between astral determinism and "soft astrology." Chioniades also emphasizes astrological influences on the body and diseases, indicating an interest in using astrology for medical purposes. The diagrams thus reveal how a shared elite scientific culture could be folded into a core text of the Byzantine ecclesiastical tradition.