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ANIMATED ICONS ON INTERACTIVE DISPLAY:
THE CASE OF HAGIA SOPHIA, CONSTANTINOPLE

Sacred spaces are where the Byzantine worshiper experienced a variety of interactions with holy images. Yet, only a few scholars have addressed the importance of worshipers vis-à-vis visual experiences with the holy image in Byzantium. A pioneering article by Robert Nelson considered what the Byzantine worshiper would see and say¹. Liz James discussed the importance of the senses and sensibility in the perception of Byzantine works of art². Continuing her line of thought, Bissera Pentcheva recently furthered the discussion of the performative aspects of images in sacred spaces in Byzantium, emphasizing the sensory and sensual experience of images³. These aspects of Byzantine images are integral to the viewer's religious experience and as such they become a part of the visual culture of sacred spaces⁴. In this connection, I will address another phenomenon of the worshiper's experience — the animation of the image in sacred space, a phenomenon that has not yet been addressed in the scholarship on religious images.

This phenomenon can best be described by relating my experiment with the mosaic icon of the Deesis in the south gallery of Hagia Sophia, Constantinople. Observing the icon during a recent visit, I had the impression that the image of Christ followed me as I was walking through the gallery (fig. 1). When I came closer to the panel and stood in front of the image of Christ, I had direct visual contact with the frontal image. When I moved to a position to the right of the panel, the image of Christ turned in my direction. I noted that the phenomenon of the image turning or moving to the right occurred only when I, the spectator, moved and saw the image at an angle. I

¹ *Nelson R. S.* To Say and to See: Ekphrasis and Vision in Byzantium // *Visuality before and beyond the Renaissance*. New York, 2000, p. 143–168.

² *James L.* Senses and Sensibility in Byzantium // *Art History*, 27.4 (2004), p. 522–537.

³ *Pentcheva B. V.* The Performative Icon // *Art Bulletin*, 88 no. 4 (2006), p. 631–655.

⁴ *Cherry D.* Art History Visual Culture // *Art History*, 27.4 (2004), p. 479–493.

concluded that the image became alive and had the ability to move only when I changed my position in relation to the image. Clearly, the phenomenon of animation appears as a result of the manipulation of a spectator's perception of an image. Such performative action stimulates religious and social interaction between the image and the spectator. For that reason, it deserves a special study.

There is no discussion or explanation of this phenomenon in studies of Byzantine art because it does not belong to a specific category of style, technique, or program. The ability to create this perception of movement evidently was known to Byzantine artists. The purpose of this paper is to explain the phenomenon by exploring theories of visual perception and the science of vision. Therefore, in this paper I will compare the phenomenon of animating images with what has been written on the science of visual perception and methods of artistic creation. I attempt to show that animated images were purposely created in Byzantine art in order to enhance the interaction between the image and the spectator. My paper is limited to mosaic images in Hagia Sophia and a few other examples in church decoration of Byzantium and the West. I discuss the nature of this phenomenon in the first section, followed by a discussion of its function in specific locations in Hagia Sophia and elsewhere.

VISUAL PERCEPTION, THE SCIENCE OF VISION, AND ANIMATED IMAGES

I begin with the term "animation." It comes from the Greek word "anima", which means soul. Animation also refers to the quality of being alive, vigorous, spirited, vital. It is often used today to refer to a series of pictures put together to produce a lifelike effect thanks to the persistence of vision. Although the term appeared around 1600, I believe that it can be applied to some images of Byzantine pictorial art as well. The phenomenon of animation could also be understood as *pikilia* (ποίκιλία), which can be translated from Greek as "diversity", nature, and so on. However it is not clear how the term was actually used in connection to art in different historical periods⁵. Therefore I will use the term animation because it can be applied to different types of movement.

In order to better understand the phenomenon of animation in Byzantine art, it is necessary to consider the theory of visual perception. The literature on the subject is vast, but it has no specific relevance to the phenomenon under discussion. Different aspects of visual perception have been studied by scholars with varied intellectual backgrounds that include mathematics and engineering, as well as knowledge of twentieth-century work in both science and

⁵ On the use of the term *pikilia* in connection with the glittering or shimmering effect in icons, see *Pentcheva B. The Performative Icon*, p. 644.

art history, especially on mathematics and theories of perspective. Innovative work was produced by such German and other European art historians as D. V. Ainalov⁶, O. Demus⁷, W. Grüneisen⁸, G. Millet⁹, A. Riegl¹⁰, O. Wulff¹¹, and others¹². Erwin Panofsky's *Perspective as Symbolic Form* (1925) exerted paramount influence and stimulated continuous debate on the subject¹³. However, Panofsky's dealt primarily with Greek, Roman, and Renaissance art; Byzantine art was treated as an era that saw the destruction of perspective between Roman illusionistic space and the linear perspective of Renaissance artists. In Russia, a monk and mathematician named Pavel Florenski worked on a study of inverse perspective between the years 1919 and 1922 but first published in 1967¹⁴. His student Lev Zhegin continued to work on the subject and published a book on reversed or inverted perspective entitled *The Language of Pictorial Representation*, published in Moscow, 1970. The progress in the study of perception of images evidently stimulated the work of Boris Rauschenbach, published his book five years after Zhegin's publication. As far as our phenomenon is concern, only Rauschenbach was able to establish an attractive theory. His book *Spatial Composition in Medieval Russian Painting (Prostranstvennie postroeniia v drevnerusskoi zhivopisi)*, published in Moscow, 1975, includes a scientific explanation of the nature of movement of some pictorial images in relation to a spectator¹⁵.

⁶ Ainalov D. V. *The Hellenistic Origins of Byzantine Art* (1900–1901). Second ed. New Brunswick, N.J., 1961.

⁷ Demus O. *Byzantine Mosaic Decoration: Aspects of Monumental Art in Byzantium*. London, 1948, esp. p. 77–82.

⁸ Grüneisen W. La perspective; Esquisse de son évolution des origines jusqu' à la Renaissance // *Mélanges d'Archéologie et d'Histoire* 31 (1911), p. 393–434.

⁹ Millet G. *Le monastère de Daphni; histoire, architecture, mosaïques*, vol. 1. Paris, 1899.

¹⁰ The most influential works of Riegl: Riegl A. *Die Spätromische Kunst-Industrie, nach den funden in Österreich-Ungarn, im zusammenhang mit der Gesamtentwicklung der bildenen Künste bei den Mittelmeervölkern*. Vienna, 1901; *idem*, *Das holländische Gruppenporträt*. Vienna, 1931. A. Riegl was one of the leading scholars of the so-called Vienna school. For analyses of his method see: Olin M. R. *Forms of Representation in Alois Riegl's Theory of Art*. University Park, Pa, 1992.

¹¹ Wulff O. Die umgekehrte Perspektive und die Niedersicht: eine Raumanschauungsform der altbyzantinischen Kunst und ihre Fortbildung in der Renaissance // *Kunstwissenschaftliche Beiträge August Schmarzow gewidmet zum fünfzigsten Semester seiner akademischen Lehrtätigkeit*. Leipzig, 1907, S. 1–40.

¹² For comprehensive analyses of literature on the study of visual perception and particularly inverted perspective see: Nyberg K. W. *Omvänt perspektiv i bildkonst och kontrovers*. Uppsala, 2000, with bibliography. See also Nelson, To Say and to See: Ekphrasis and Vision in Byzantium, p. 143–168.

¹³ Panofsky E. Die Perspektive als 'Symbolische Form' // *Vorträge der Bibliothek Warburg, 1924–1925* (1927), p. 258–330.

¹⁴ Флоренский П. А. Обратная перспектива. Т. 3 (1). Москва, 1999, с. 46–98.

¹⁵ See also Rauschenbach B. V. On my concept of perceptual perspective that accounts for parallel and inverted perspective in pictorial art // *Leonardo* 16, No. 1 (1983), p. 28–30.

Rauschenbach was a distinguished Russian scientist, physicist, and rocket engineer, known for his work on the navigation of spacecraft as well as a theory of vision in space. His book includes an analysis of the mathematical foundation of perspective in art, including inverted perspective, linear perspective, and perceptual perspective. Rauschenbach discussed the use of linear perspective, inverted, and perceptual perspectives in medieval Russian art. The focus of the book, however, was on perceptual perspective, a natural form of vision. He devoted two pages in his book to the constancy of vision — an engine of perceptual perspective.

Observing this phenomenon in portraits, Rauschenbach calls it a “phenomenon of constancy of vision” that accounts for size and shape constancy¹⁶. Size constancy is a fundamental attribute of visual perception; it is a tendency to perceive the size of an object despite differences in its distance. Shape constancy is the tendency to perceive the shape of an object as constant despite differences in the viewing angle. Shape constancy plays an important role in small distances between viewer and object, and Rauschenbach illustrated its function in painted portraits¹⁷. He did not, however, specify a period in which these portraits were created, nor did he provide illustrations. He noted that some portraits have an ability to look into the eyes of the spectator and thus create an interesting effect. He was correct about such portraits. This phenomenon of the portrait becoming alive and following the viewer was well known and appreciated, especially in the nineteenth and early twentieth century, as for example in the portrait of a man by Jean-Auguste-Dominique Ingres at the Norton Simon Museum in Pasadena (figs. 2–3). The subject of “the animated portrait” became popular in literary works, such as the *Picture of Dorian Grey*, by Oscar Wilde, or the short story entitled “The Portrait” by Anton Chekhov. Rauschenbach illustrated his point with a diagram that shows the position of the spectator and the influence of the phenomenon of constancy on the perception of his vision (fig. 4)¹⁸. This diagram demonstrates that at position A, the spectator sees a portrait in the way it was created by the artist. If the spectator moves to positions B and C, he will see all details correctly on the horizontal line, but there will be distortion of the image on the vertical line: the image will be a little elongated. There will also be a difference in proportion, especially between the eyes and nose. During the viewer’s gradual observation of the portrait, the retina of the eyes corrects the distortion and the discrepancies in the proportions of the portrait will not be obvious. Rauschenbach provided mathe-

¹⁶ Раушенбах Б. В. Пространственные построения в древнерусской живописи. Москва, 1975, p. 168–169.

¹⁷ Ibid.

¹⁸ Ibid., 169, dr. 1.

mathematical calculations that explain the level of distortions¹⁹. He also gave an explanation of how the artist is able to achieve movement. If the artist depicts a person and makes the line of his shoulders parallel to the surface of the picture or frame, the depicted person is attached to the surface and the image does not move. If the artist depicts the shoulders of a person at an angle to the surface, he achieves the effect of the movement in the portrait. Rauschenbach also noticed this effect in works of Leonardo da Vinci such as the Mona Lisa. But at the conclusion of his observations on portraits, he stated that this phenomenon is not found in medieval Russian or Byzantine art²⁰. Although Rauschenbach's theory of constancy in visual perception in relation to the portrait is important for understanding this phenomenon, he overlooked the phenomenon in Byzantine and medieval Russian art. He may be forgiven — he was not an art historian and probably had never traveled to see Byzantine churches, and he relied on Russian and Western art history literature of visual perception that had not yet treated the question of animated images.

Recently, Rizan Kulenovic of the museum of Kulenovic Collection in Karlskrona, Sweden, published an essay on movement in Leonardo's paintings²¹. Several images in portraits painted by Leonardo da Vinci turn, including the Mona Lisa. Kulenovic also noted proportional discrepancies in some paintings by Leonardo and suggested that Leonardo used mirrors to achieve the effect. Although Renaissance artists did experiment with mirrors, I am not convinced by this theory. Leonardo's interest in turning parts of the human body is documented by his drawings, some of which resemble a type of animated cartoon, and by his notes in Codex Madrid 1 and 2, where he wrote about human movement²². On the basis of these studies Leonardo wrote a *Treatise on Painting*²³. I also found this phenomenon in paintings by other Renaissance artists, for example the sixteenth-century portrait of a man by Moroni (Norton Simon Museum, Pasadena). How Leonardo and his contemporaries achieved the impression of figures turning toward the spectator is a question that needs further examination. The fact of Leonardo's interest in Roman, late antique, and medieval paintings in Italy suggests that he and his contemporaries may have gleaned this idea from past painters, indeed from the distant past. I examined some late antique images and was able to observe the

¹⁹ Раушенбах, Пространственные построения в древнерусской живописи, p. 168–169.

²⁰ Ibid.

²¹ Kulenovic R. Human Movement and Turning of Limbs and Bodies in Paintings made by Leonardo da Vinci / Not dated. This electronic essay can be found on the web site of the Museum of Kulenovic Collection.

²² The Literary Works of Leonardo da Vinci / Ed. J. P. Richter. 2 vols. New York, 1977, 1: p. 227–290.

²³ Ibid., p. 325–372.

phenomenon of animation in Fayum portraits, as for instance a portrait of a man in the Pushkin Museum, Moscow²⁴.

If the late antique and Renaissance artists were familiar with the phenomenon of animated images, then Byzantine art may be the missing link. In the second part of my paper I will discuss the existence of the phenomenon of animated images in Byzantine art, specifically in Hagia Sophia and other examples.

HAGIA SOPHIA, SOUTH GALLERY: THE DEESIS

I return to the icon of the Deesis in Hagia Sophia in order to observe further the nature of this phenomenon of the interaction between the image and the spectator.

Hagia Sophia, as the cathedral of Constantinople, had both religious and social functions. Its nave, aisles, galleries, and narthexes were used for multiple activities in which visitors and images were engaged. A case in point is the south gallery where the mosaic of the Deesis is located (fig. 5). The gallery had an imperial *metatorion* and patriarchal quarters²⁵. It was used by emperors, patriarchs, and clergy, as well as by regular worshipers and eminent guests. It was also used for church councils. But how did the function of this gallery and its spatial dynamics affect the visual and pictorial characteristics of the Deesis? And to what extent did the context of the spatial placement of the mosaic dictate the spatial dynamics of the images?

Although the date of the Deesis is uncertain, most scholars have assigned it on stylistic grounds to the early Palaeologan period (fig. 1)²⁶. The mosaic panel is located on the south side of the west wall of the central bay. The original

²⁴ There are no publications of the side views of this image.

²⁵ Whittemore T. The Mosaics of Hagia Sophia at Istanbul. Fourth Preliminary Report, work done in 1934–1938. The Deesis Panel of the South Gallery. Boston, 1952, p. 9–50.

²⁶ Whittemore dated it to the twelfth century: Whittemore, The Mosaics of Hagia Sophia at Istanbul. Fourth Preliminary Report, p. 9–50, esp. 30–31, pl. XIV. Cf. Grabar A. La peinture religieuse en Bulgarie. Paris, 1928, p. 107; Velmans T. La peinture murale byzantine à la fin du moyen âge. Paris, 1977, p. 117, 120–21, with bibliography. Later scholars recognized that the Deesis is close in figure type and style to Paleologan monuments, especially to the second part of the thirteenth century: Demus O. Die Entstehung des Paläologenstiels in der Malerei // Berichte zum XI Internationalen Byzantinisten-Kongress. Munich, 1958, p. 55–57; *ibid.*, Zwei Konstantinopler Marienikonen des 13. Jahrhunderts // JÖB.G 7 (1958), p. 95–98. Beckwith J. Early Christian and Byzantine Art / Second ed. London, 1979, p. 302, and fig. 268; Talbot Rice D. The Art of Byzantium. London, 1959, pls. XXV–XXVII; *idem*. Byzantine Painting: the Last Phase. New York, 1968, p. 29. Cormack placed it immediately after re-conquest of Constantinople from the Crusaders (1261): Cormack R. Interpreting the Mosaics of S. Sophia at Istanbul // *Art History*, vol. 4, no. 2, 1981, p. 145–146. *Idem*. The Emperor at St. Sophia, p. 243–245. See also Mango C. Materials for the Study of the Mosaics of St. Sophia at Istanbul. Washington, D. C., 1962, p. 29; Mango C., Ertuğ A. Hagia Sophia — A Vision for Empires. Istanbul, 1997, p. 133, fig. pp. 132–133.

composition of the Deesis consisted of over-life-size figures of the Virgin, Christ, and John the Baptist; the mosaic was displayed between the upper and lower marble cornices. Only upper parts of the three figures survive. Thomas Whittemore with his team of conservators uncovered the Deesis in the 1930s.²⁷ He also found floor marks in front of the image that suggested the Deesis was a part of a shrine²⁸. His plan shows the location of the marks for an enclosure and an additional set of marks at the center (fig. 6)²⁹. The northern section of a marble parapet is visible in an eighteenth-century drawing by Cornelius Loos (fig. 7)³⁰. This enclosure was approximately 1 meter high and had a double purpose. It separated the Deesis mosaic from the rest of the gallery and it allowed the viewer standing outside of the enclosure to observe the icon. If the viewer were to stand inside the area of the enclosure and in front of the Deesis, he would notice that the glances of the Virgin and John the Baptist are directed down toward the floor just near the figure of Christ, suggesting that something of importance was situated there, amounting to a focal part of this enclosed space. It is difficult to know what it was. It may have been a portable altar like the one in the private cell of St. Neophytos at his enkleistra near Paphos, on Cyprus, where the Deesis served a devotional function for the saint³¹. In the case of the twelfth-century Cappella Palatina in Palermo, the very large mosaic ensemble of Christ flanked by Peter and Paul was displayed on the western wall above the area where the throne of the ruler could have been³². In the Deesis of Hagia Sophia, John the Baptist and Mary are turned toward Christ; both are engaged in prayer. At the same time, the image of Christ and, especially, his face has a direct contact with viewers. This composition is traditional. What is unusual is that the image of Christ has an animated quality.

As the viewer moves through the gallery from the east bay toward the Deesis, the images, especially that of Christ, quickly become visible. The viewer establishes immediate eye contact with the image of Christ. Indeed, the eyes of Christ become fixed upon the viewer (fig. 1). The viewer achieves personal contact with the animated image of Christ as she or he moves through the gallery from east to west, passing through the entire central bay. If one walks to the right of the enclosure near the Deesis

²⁷ Whittemore, *The Mosaics of Hagia Sophia at Istanbul*. Fourth Preliminary Report, esp. p. 9–15.

²⁸ Ibid., 10–26, pls. XXXIII, XXXVI.

²⁹ Ibid, plan on p. 11.

³⁰ Mango, *Materials for the Study of the Mosaics of St. Sophia at Istanbul*, fig. 22.

³¹ Mango C., Hawkins E. J. W. *The Hermitage of St. Neophytos and Its Wall Paintings* // *DOP* 20 (1966), p. 180–183, plan D, fig. 93.

³² Borsook E. *Messages in Mosaic. The Royal Programmes of Norman Sicily (1130–1187)*. Oxford, 1990, p. 20–22, pls. 17, 19; Tronzo W. *The Cultures of his Kingdom: Roger II and the Cappella Palatina in Palermo*. Princeton, N. J. 1997, p. 9–10, 17–18, 68–77, pl. VIII, figs. 6, 9, 36, 47.

panel, the viewer discovers that the figure of Christ gradually turns in his or her direction. Depending on the position of the viewer, the image turns specifically to the right. The image can also turn to the left, but only to a lesser degree because the major observation point is from the center and the north side of the south gallery. Space on the south side of the Deesis is limited. One can also move slowly from the center of the bay to the right side of the gallery and observe the gradual movement of the figure of Christ toward the viewer. This movement can be illustrated by a computer program that allows us to turn the frontal image from left to right or from south to north (fig. 8).

How was the artist able to move the image virtually from left to right so that the spectator could have contact with it? How does one explain the particular quality of animation within this image?

We can examine the image of Christ in the Deesis to determine whether Rauschenbach's theory applies to Byzantine images. The computer drawing of the figure of Christ shows a slight difference in the execution of the two parts of his body. The right side of his body is frontal, but the left side is an angled slightly obliquely specifically to allow the image to turn to the right. His right shoulder, draped in a himation, is slightly higher than the left. (All bodily descriptions refer to the viewer's left and right). His hand, posed in the gesture of blessing is not oriented toward the viewer standing in front of him, but is turned to the right. This can also be observed in the face of Christ (fig. 9). The right side of his face (from the spectator's viewpoint) is much larger than the left side. This seems purposely done to correct the distortion of the image on a horizontal line. The right eyelid is larger and fully outlined with dark tesserae, but the left eyelid is only partially outlined, allowing the eye to move from left to right. A slight asymmetry can be observed in the left and right sides of his nose, lips and beard. The right nostril of his nose, for example is considerably higher than the left one. This asymmetry in the two parts of the body and face were, in my view, done intentionally to allow the image to have a gradual movement from the center of observation to right side. Optical illusion does the final trick in allowing our eyes gradually see the movement³³. The theory of vision and optics, especially the works of Aristotle, Plato, Ptolemy, and especially Euclid, were at the core of Byzantine science of vision³⁴. It seems that the Byzantine artists were aware of optical illusion and knew how to enhance

³³ On optical illusion see *Gombrich E. H. Art and Illusion, A Study in the Psychology of Pictorial Representation*. New York, 1960.

³⁴ *Lindberg D. C. "Optics, Western European"*. Dictionary of the Middle Ages. New York, 1987, 9: 240–253. See also *Nelson, To Say and to See: Ekphrasis and Vision in Byzantium*, p. 150–153. On ancient science of vision see: *Lindberg D. C. Theories of Vision from Al-Kindi to Kepler*. Chicago, 1976; *Brownson C. D. Euclid's Optics and Its Compatibility with Linear Perspective // Archive for the History of Exact Sciences* 24 (1921), p. 166.

the effect by adding proportional discrepancies. This may partially explain how medieval mosaicists achieved the movement of figures and faces. The general principle is similar to that of the animation technique when one deploys a series of pictures to simulate movement.

Unfortunately, no medieval treatises survive to explain this phenomenon. It seems likely that the traditional structure of apprenticeship training for artists and mosaicists in studios and workshops passed down this tradition from master to student through the centuries from late antiquity to the Renaissance and even the modern period. Our knowledge of how the Byzantines saw the animated images is limited. However, a twelfth-century passage from Nikolaos Mesarites describing a half-figure image of Christ in the dome of the church of the Holy Apostles, Constantinople, may provide a clue:

This dome shows in pictured form the God-Man Christ, leaning and gazing out as though from the rim of heaven, at the point where the dome begins, toward the floor of the Church and everything in it, but not with His whole body or in His whole form. ... Wherefore one can see Him, to use the words of the Song, looking forth at the windows, leaning out as far as His navel through the lattice at the summit of the dome like an earnest and vehement lover³⁵.

This passage describes the viewer's (Mesarite's) interaction with the image of Christ, probably due to the image's ability to move.

Public viewing of the Deesis in Hagia Sophia was important. Considering the large size of the figures, the spirituality of their faces, and the quality of the execution, the Deesis no doubt presented an overwhelming religious and visual experience. It was created as a devotional icon to be a part of a sacred space but also to engage the viewer deliberately in a spiritual dialogue. The performativity of the Deesis was manifested through its animation. The artists of the Palaeologan era added a deeper spiritual engagement between the public and an image through pictorial means.

SOUTH GALLERY: IMPERIAL PORTRAITS

Let us examine earlier mosaic images in Hagia Sophia to see how artists used this trick to achieve the animation of images in other locations in the church. An example is a pair of imperial portraits on the east wall of the east bay of the south gallery, one with Constantine IX and Zoe (1042–1055) and the other depicting John II Komnenos (1118–

³⁵ Downey G. Nikolaos Mesarites: Description of the Church of the Holy Apostles at Constantinople // *Translations of the American Philosophical Society* 47, no. 6 (1957), p. 869–870.

1143), his wife Eirene, and their son Alexios (figs. 5, 10–11)³⁶. These two portrait panels, the only ones that have survived, are situated to the north of a wooden door on the east wall that is now locked. This door is important because, according to the *Book of Ceremonies* and other accounts, the emperor and his court used it to enter Hagia Sophia directly from the Great Palace, via a two-storey walkway that connected the palace with the Great Church³⁷. The wooden staircase, which no longer exists, was outside this door. The south bay was reserved for the imperial *metatorion* and was connected with the patriarchal quarters in the central bay³⁸. Processions including the emperor, courtiers, clergy, and eminent visitors went through this part of the gallery. Thus, the Zoe and John panels were located on the wall to the north of the door through which the processions went.

Examination of the portraits shows that they are executed so that they would be visible to the visitors of the imperial *metatorion* both at close quarters and from a distance. Like the Deesis, both panels were placed high on the wall, just below the upper cornice. Both panels were approximately life-size, smaller than the Deesis. Only two-thirds of the figures have survived.

Because the Zoe panel is far away from the door, the figures and faces of Constantine and Christ are turned slightly sideways to be oriented toward a distant viewer (figs. 12–13). Scholars have suggested that the faces of Constantine, Christ, and Zoe were changed due to Zoe's previous marriages

³⁶ Whittemore, *The Mosaics of Hagia Sophia at Istanbul. Third Preliminary Report, Work Done in 1935–1938. The Imperial Portraits of the South Gallery*, Boston, 1942, p. 1–87, pls. II–XXXVI; Mango, *Materials for the Study of the Mosaics of St. Sophia at Istanbul*, p. 27–29; Lazarev V. *Storia della pittura bizantina*. Turin, 1967, p. 197–198; Oikonomides N. *The Mosaic Panel of Constantine IX and Zoe in Saint Sophia* // *REB* 36 (1978): 220ff; Cormack, *Interpreting the Mosaics of St. Sophia at Istanbul*, p. 179–200; Hill B., James L., Smythe D. *Zoe: The Rhythm Method of Imperial Renewal* // *New Constantines: The Rhythm of Imperial Renewal in Byzantium, 4th–13th Centuries* / Ed. P. Magdalino. Symposium of British Byzantine Studies, St. Andrews, March 1992, Brookfield, Vt., 1994, p. 215–229; Rodley L. *Byzantine Art: An Introduction*. Cambridge, 1994, p. 232–234; Kalavrezou I. *Irregular Marriages in the Eleventh Century and the Zoe and Constantine Mosaic in Hagia Sophia* // *Law and Society in Byzantium: Ninth-Centuries* / Eds. A. E. Laiou and D. Simon. Washington D.C., 1994, p. 241–259.

³⁷ Mango C. *Brazen House*. Copenhagen, 1959, p. 69–70, 90–91; Mathews T. F. *The Early Churches of Constantinople: Architecture and Liturgy* / 2nd ed. New York, 1977, p. 93–94; Teteriatnikov N. *Hagia Sophia: The Two Portraits of the Emperors with Money Bags as a Functional Setting* // *Arte Medievale*, 1996, p. 47–66, esp. 49–52.

³⁸ On the imperial *metatorion*, see Papadopoulos J. B. *Le metatorion des églises byzantines* // *Mémorial Louis Petit*, 1, Bucharest, 1948, p. 366–368; Mathews, *Early Churches*, p. 132–133; Baldovin J. F. *The Urban Character of Christian Worship, the Origins, Development, and Meaning of Stational Liturgy* // [OCA 228], Rome, 1987, p. 177–178.

to Romanos³⁹ or Michael⁴⁰. We do not know exactly which emperor was replaced. Whittemore correctly explained that the three faces had to be changed together to achieve the same style⁴¹. An additional reason, in my view, is that it was also necessary to coordinate the glances of the three faces in connection with their orientation toward the viewers. The peculiar composition of the figures — their postures, gestures, and facial orientation — was executed in connection with the viewer standing in front of these panels and also with the viewers in the processions coming through the above-mentioned door. For example, there is asymmetry in Christ's figure. His left shoulder is higher than the right one, his hand in a gesture of blessing is turned not toward the spectator in front of him but sideways, toward the door. Even the book on his left knee is turned at an angle. The left side of his face is larger than the right side. His facial expression is odd and asymmetrical, allowing the image to turn toward the distant visitors. Therefore the image functioned as a devotional image at close quarters and also turned towards distant viewers passing through this part of the gallery.

The figures of John II and Eirene in the other panel are more or less frontal (fig. 14). Only their gifts, the sack of money in the hands of John and the scroll in the hands of Eirene, are oriented toward the Virgin. The head of John and especially his eyes are slightly turned to the south as though welcoming an anticipated viewer. His right shoulder is higher than the left one and his right arm is unusually long. Because this panel is closest to the door, the discrepancies in the representation of figures and faces are small and scarcely visible. But the viewer standing in close proximity to the panel and the door discovers that the image of the Virgin and John turn in his direction (fig. 15).

THE APSE: THE VIRGIN AND CHRIST CHILD

A similar moving effect can also be observed in the image of the Virgin in the apse of Hagia Sophia (ca. 867) (fig. 16)⁴². The figure of the Virgin is not

³⁹ Whittemore T. The Mosaics of Hagia Sophia at Istanbul. Third Preliminary Report: p. 17–20; *Oikonomides N.* The Mosaic Panel of Constantine IX and Zoe in Saint Sophia // *REB* 36 (1978): 220–232.

⁴⁰ *Teteriatnikov*, Hagia Sophia: The Two Portraits of the Emperors with Money Bags as a Functional Setting, p. 55–57.

⁴¹ Whittemore, The Mosaics of Hagia Sophia at Istanbul. Third Preliminary Report, p. 20.

⁴² *Mango C.* The Homilies of Photius, Patriarch of Constantinople. Cambridge, MA., 1958, p. 286–296; *idem*, Materials for the Study of the Mosaics of St. Sophia at Istanbul, p. 80–83, 93–95; *Mango C. and Hawkins E. J. W.* The Apse Mosaics of St. Sophia at Istanbul. Report on Work Carried Out in 1964 // *DOP* 19 (1965), p. 113–151; *Cormack*, Interpreting the Mosaics of St. Sophia at Istanbul, p. 135–138. Several scholars believed that in his homily Photios spoke of a standing image of the Virgin with Christ Child, type Hodegetria. See *Oikonomides N.* Some Remarks on the Apse Mosaic of St. Sophia // *DOP* 39 (1985), p. 111–115. See also *Galavaris G.* The representations of the Virgin and Child on a 'Thokos' on Seals of the Con-

aligned with its central axis, which is marked by the central window⁴³. It would not have been difficult for the mosaicists to align the entire composition, but they made the figure of the Virgin notably off-center. She is not symmetrically set on the throne. While the upper part of her body is turned to the north, the lower part and her left foot are placed at the extreme right corner of the footstool. In addition, the cushions are shifted to the north side of the throne. Christ's legs are also turned toward the right. The faces of the Virgin and Christ and especially the glances of their eyes are slightly oriented to the north. The Virgin's left arm and hand (from viewer's view) are unusually smaller than her right⁴⁴. The left eye of the Virgin is considerably bigger than the right, suggesting that the artists purposely created these discrepancies in order to manipulate the image's movement. As a result, although the image of the Virgin looks generally oriented to the spectator in the central nave, there are several sites in the church from where the image is best observed.

One favorable viewpoint is the location behind the balustrade of the central bay of the south gallery (fig. 17). The orientation of the Virgin's figure toward the southeast section of the nave and gallery responded to the position of the patriarch in the south gallery during church services. Antony of Novgorod left an important account of the location of the patriarch in the south gallery⁴⁵. The liturgy did not change substantially between the time of the mosaic's installation and Antony's visit. According to him, the patriarch blessed the *psaltai* (singers) from the south gallery of Hagia Sophia at matins (morning services that precede the Eucharist) and during the liturgy on weekdays and for the Great Feasts. The patriarch also blessed the congregation. He stood behind the marble balustrade, probably in the central bay because it corresponds to the location of the ambo in the nave where the *psaltai* stood. From this point, the Virgin and Child in the apse appear to turn in his direction (fig. 17).

stantinopolitan Patriarchs // Δελτ. Χριστ. 'Αρχ. 'Ετ. 4/2 (1960/61), p. 153–181. Cf. *idem*. Observations on the Date of the Apse Mosaic of the Church of Hagia Sophia in Constantinople // Actes de XIIe Congrès international d'Etudes Byzantines, III. Belgrade 1964, p. 107–110. Galavaris' opinion was accepted by Laurent: *Laurent V.* Le Corpus des Sceaux de l'Empire byzantin, V/1. Paris, 1963, no. 45. See also *Teteriatnikov N.* Hagia Sophia, Constantinople: Religious Images and Their Functional Context after Iconoclasm // *Zograph* 30 (2004–2005), p. 9–13, figs. 3–5.

⁴³ For asymmetrical composition of the Virgin see: *Teteriatnikov*, Hagia Sophia, Constantinople: Religious Images and Their Functional Context after Iconoclasm, p. 11–13, fig. 3.

⁴⁴ Cyril Mango noticed disproportions in the Virgins and Christ Child's figures. He indicated that the feet and head of the Virgin are too small and her right hand is smaller than her left hand: *Mango C., Hawkins E. J. W.* The Apse Mosaics of St. Sophia at Istanbul. Report on Work Carried out in 1964, p. 116–117.

⁴⁵ *Антоний Новгородский.* Книга Паломник. Сказание мест святых во Царьграде / Ред. Х. М. Лопарев // Православный палестинский сборник. СПб., 1899, с. 17.

Another privileged location is the imperial *metatorion* in the eastern bay (fig. 18). Here the emperor attended the liturgy and held various receptions⁴⁶. For an onlooker standing behind the transenna opening close to the apse, the Virgin and Child will appear turned toward the emperor or any other viewer in this location. One can also obtain a similar view near the same location in the east bay of the north gallery. The reason is that in churches of both West and East the nobility stood at the front of the congregation. It is possible that the empress and her court may have stood in this location, though we do not know exactly where the empress stood during the liturgy. There is an inscription on the marble parapet, close to the sanctuary, that includes the name Theodora⁴⁷. It dates from the Middle Byzantine period, and is an indication that noblewomen may have stood there. Thus the customized view of the image of the Virgin played an important role during the liturgy when the emperor, empress, patriarch, and nobility were attending.

In the images discussed above, the mosaicists used asymmetry in the compositional layout of figures and faces in order to achieve image movement. Images were made to attract the viewer's attention in important locations and promote an interaction between the image and the public. This can be explained by the function of different areas of Hagia Sophia. Images can turn to be viewed both frontally and from the sides to enhance social and religious interaction. The difference between the images and their execution of movement and viewer engagement is due to their style and their spiritual perception in the different periods in which the images were created. For example, the radical difference between the Deesis and its predecessors is that the Deesis images manifest a highly spiritual humanistic expression that engaged the viewer in deep contemplation — a new humanistic trend in Palaeologan art⁴⁸. Moreover, the focus of this engagement is specifically between the viewer and Christ, who appears as a key spiritual figure in the theological treatises of church fathers in the second part of the thirteenth and especially the fourteenth century.

HAGIA SOPHIA, KIEV, UKRAINE: THE APSE

Does Hagia Sophia present a unique example of the animation phenomenon? A parallel case is found in Hagia Sophia in Kiev, Ukraine, founded by Prince Yaroslav ca. 1037 (fig. 19)⁴⁹. This is the largest metro-

⁴⁶ On the imperial *metatorion* on the south gallery see note 38.

⁴⁷ A copy of this inscription is in the Image Collection and Fieldwork Archives, Dumbarton Oaks.

⁴⁸ Teteriatnikov N. The New Image of Byzantine Noblemen in Palaeologan Art // *Quaderni, Utinensi* 15/16 (1996), esp. p. 314–317.

⁴⁹ Логвин Г. Н. София Киевская. Киев, 1971, p. 7–31, fig. 18; Комеч А. И. Роль княжеского заказа в построении Софийского собора в Киеве // *Древнерусское искусство*. Москва, 1972, p. 50–64.

politan cathedral in Kiev. The central nave is flanked by aisles and galleries. Alexei Komech pointed out that during this period galleries were not used in the architecture of Constantinople⁵⁰. He suggested that galleries were constructed in the cathedral of Kiev as an imitation of the galleries in Hagia Sophia in Constantinople⁵¹. The depiction of Prince Yaroslav and his family on the north, south, and west walls of the nave is a clear indication of the participation of the family in the liturgical ceremonies of the church⁵². The imitation of the galleries in this church is not just architectural inspiration; it was the function of the galleries of Hagia Sophia in Constantinople that attracted Prince Yaroslav's attention. One of the most striking images is the Virgin Orant in the central apse⁵³. At first impression, the image is frontal and clearly oriented to be seen from the central nave where the liturgical and royal processions took place. Yet the view from the eastern bay of the south gallery reveals that a viewer standing there and looking through the gallery opening was able to see a frontal view of the image of the Virgin as if she were turned toward the viewer (fig. 19)⁵⁴. This location in the gallery is just above the fresco depicting a procession of Yaroslav and his sons on the south wall of the central nave. A special angular compositional treatment of the figure of the Virgin and her face enhances the image's movement, especially toward the southeast end of the gallery where the prince would have been. This view also suggests that this part of the gallery was an important place from which the image of the Virgin could also be observed.

CHURCH OF COSMAS AND DAMIAN, ROME: THE APSE

Another example is the church of SS. Cosmas and Damian in Rome built by Pope Felix IV (526–530)⁵⁵. The apse of this church depicts Christ walking on clouds between Pope Felix, St. Cosmas, apostles Paul and Peter, St. Damian, and St. Theodore (fig. 20). Christ holds a scroll in his left hand and his right is extended as if he is blessing the congregation. The image of Christ is well observed from the center of the nave where the celebration of the liturgy takes place. At the same time, the viewer or viewers who are located just to the north or south side and close to the apse can also observe the frontal image of Christ as if he is turned in their direction (fig. 21). According to the custom of the Roman churches, the eastern portion of the north and south aisles (which were turned during Renaissance period into chapels)

⁵⁰ *Комеч*, Роль княжеского заказа., p. 50–64, esp. 50–59.

⁵¹ *Ibid.*, esp. p. 64.

⁵² *Логвин*, София Киевская, p. 32 and drawing 13.

⁵³ *Ibid.*, drawings 12–13.

⁵⁴ *Ibid.*, fig. 18.

⁵⁵ *Matthiae G.* Mosaici medioevali delle chiese di Roma. Rome, 1967, p. 135–141, pl. 78.

were reserved as a *matroneum* (north) and *senatorium* (south)⁵⁶. These elite boxes were used by the wealthy matronas and senators of Rome during the liturgy. From there they would have a favorable view of Christ and receive his blessing.

CONCLUSION

The evidence of the mosaics of Hagia Sophia leads to the conclusion that the phenomenon of animated images, in which the image moves together with the spectator, existed in Byzantine and Western medieval art. The phenomenon can be explained by the science of constancy of vision combined with the artists' intervention. By manipulating the asymmetry of the composition as well as figures and faces, artists were able to enhance the movement of figures. Optical illusion did the final trick, allowing viewers to see gradual movement in the images and hiding proportional discrepancies in the figures. The phenomenon of animation allow images to interact with the public in important locations in the church, as seen at Hagia Sophia in Constantinople and Kiev or the church of Sts. Cosmas and Damian in Rome, as well as in the apses of many other churches, such as Hosios Loukas in Greece or Sta. Maria Maggiore in Rome, and others. Depending on the particular setting, there might be a need for multiple views of an image. For the viewing public the images served as an important locus of spiritual and social interaction.

⁵⁶ *De Benedictis E.* The "schola cantorum" in Roman churches during the High Middle Ages / Ph. D. diss., Bryn Mawr College, 1977, p. 9–12; *eadem.* The Senatorium and Matroneum in the Early Roman Church // *Rivista di Archeologia Cristiana*, 57, 1981, p. 69–85; *Mathews T.* An Early Roman Chancel Arrangement and Its Liturgical Functions // *Rivista di Archeologia Cristiana* 38 (1962), p. 73–95.

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ОЖИВАЮЩИЕ ИКОНЫ В ИНТЕРАКТИВНОМ ПРОСТРАНСТВЕ СВЯТОЙ СОФИИ КОНСТАНТИНОПОЛЬСКОЙ

В качестве главного собора Константинополя Святая София обладала особыми религиозными и социальными функциями. Ее центральный и боковые нефы, галереи, нартекс использовались для многих церковных обрядов, в которые были вовлечены как посетители храма, так и находившиеся там изображения. В данной работе речь пойдет о Южной галерее, где расположен мозаичный Деисус, а кроме того — имперский *метаторион*, или патриарший покой, которыми пользовались император, патриарх и духовенство, а также постоянные прихожане и гости. Нас интересует, как структура галереи и ее пространственная организация влияли на восприятие мозаичного Деисуса и его функции.

Датировка Деисуса неопределенна, но на основании стилистических особенностей специалисты датируют его ранним Палеологовским периодом. Деисус находится на западной стене центральной части галереи. Изначально вся композиция включала фигуры Богородицы, Христа и Иоанна Крестителя, выполненные в натуральную величину и помещенные прямо над нижним карнизом. По отметкам на полу перед Деисусом Томас Уиттемор сделал предположение, что Деисус был частью особого пространства, внутреннего святилища. Северная часть мраморного парапета видна на рисунке Комелиуса Луса, сделанном в XVIII в. Это ограждение было примерно 1 м в высоту и имело двойное назначение. Во-первых, оно создавало особое сакральное пространство перед Деисусом. Во-вторых, оно позволяло зрителю, стоявшему вне границ святилища, видеть икону. Более того, особым образом трактуя фигуры и лица, средневековые художники создавали эффект оживления образов с целью напрямую обратиться к предстоящему и вовлечь его в процесс наблюдения и сопереживания, независимо от того, находился человек внутри или снаружи святилища.

Если зритель стоял во внутренней зоне святилища, близко к стене, перед фигурой Христа, он мог заметить, что взгляды Богородицы и Иоанна Крестителя обращены вниз, на пол прямо перед фигурами, что предполагает, что там находилось нечто важное. И в самом деле, пол перед фигурой Христа сохранил некоторые следы. Трудно сказать, что это было. Возможно, здесь был установлен алтарь, как в пещерной личной келье св. Неофита в Энклистре на Пафосе, где Деисус являлся объектом регулярного поклонения святого. В случае Палатинской капеллы в Палермо (XII в.) мозаичная композиция, представлявшая Хри-

ста с предстоящими свв. Петром и Павлом, была расположена на западной стене над местом, где мог стоять трон правителя. В Святой Софии направление взглядов и особая одухотворенность лиц Девы Марии и Иоанна как посредников и заступников направляли внимание молящихся на сакральный объект непосредственно перед Деисусом.

Наблюдение за Деисусом из той части галереи, что была за границами парапета, показывает, что восприятие ориентации фигур и выражения лиц меняется. Благодаря своему расположению, мозаика лучше видна зрителю, который входит в центральное пространство с востока. Продвигаясь по галерее в сторону Деисуса, сразу видишь образы — и прежде всего образ Христа. Ориентация его взгляда правее центра создает впечатление, что глаза Христа обращены прямо на зрителя, который вступает в моментальный контакт с оживающим образом Христа, проходя с востока в сторону центральной части галереи. Это «оживление» деисусных образов находит параллель в образах Константина IX и Зои (1042–1055), а также Иоанна II Комнина (1118–1143), его жены Ирины и их сына Алексея, предстающих перед зрителем имперского *метаториона* и вблизи, и на расстоянии. Отличия образов Деисуса от этих предшественников состоит, прежде всего, в большей одухотворенности выражения лиц, что вызывает у зрителя глубокое сопереживание. Это можно считать новой гуманистической тенденцией в Палеологовском искусстве.

То, как публика воспринимала Деисус, крайне важно. Учитывая значительный размер фигур, одухотворенность их лиц и качество исполнения, Деисус, без сомнения, в свое время был поразительным зрелищем. Он был намеренно создан как икона для поклонения, как часть сакрального пространства, но, в то же время, был рассчитан на духовный диалог с предстоящими ему. Перформативность Деисуса актуализировалась за счет эффекта оживления фигур. Это оживление было вполне сознательным методом, знакомым художникам средневековья. Палеологовская эпоха добавила к нему более глубокую духовную связь между публикой и образом.



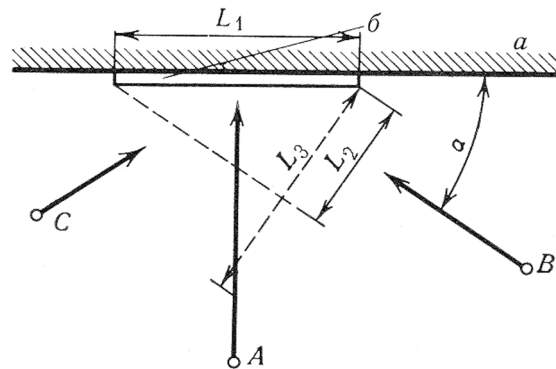
1. Hagia Sophia, Istanbul. Deesis, front and side views
(photo: N. Teteriatnikov)



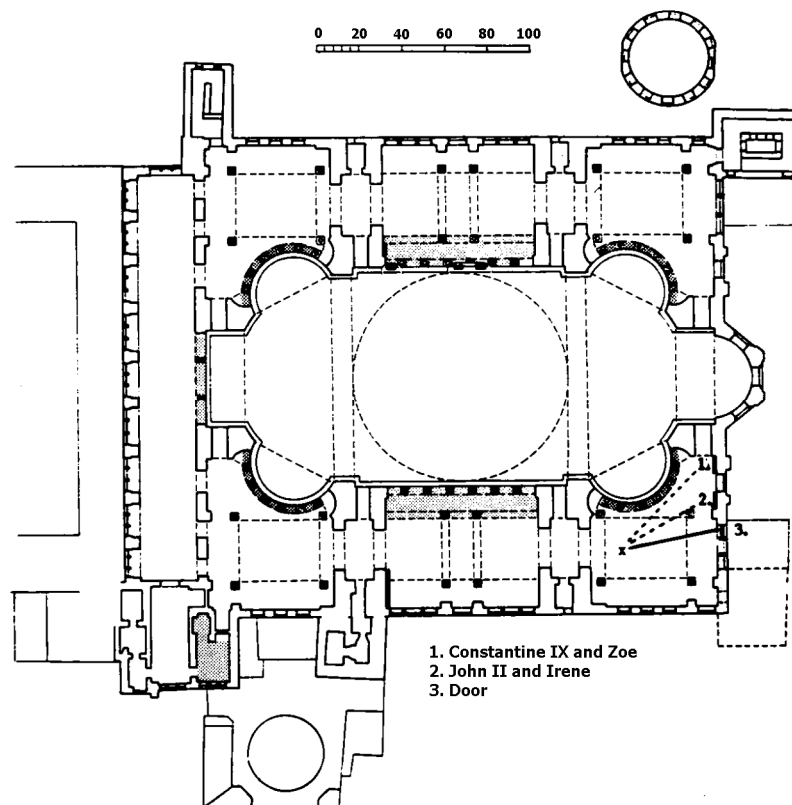
2. Portrait of a man, Jean August Dominique Ingres, the Norton Simon Museum, Pasadena
(photo: N. Teteriatnikov)



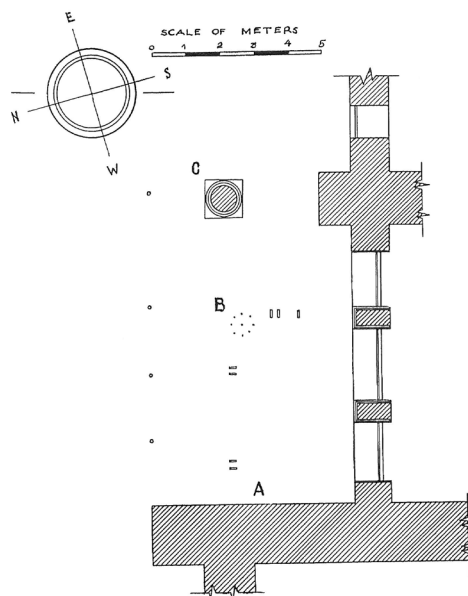
3. Portrait of a man, view at the right angle



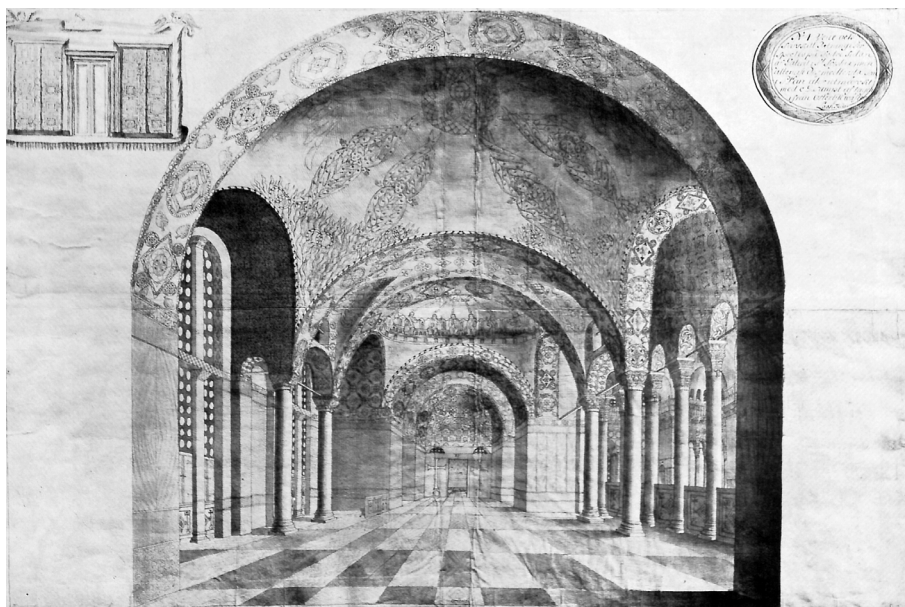
4. Diagram by B. Rauschenbach (after Раушенбах Б. В. Пространственные построения в древнерусской живописи, с. 169, рис. 1)



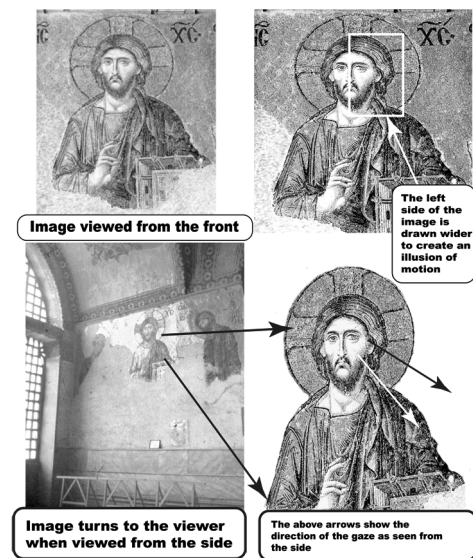
5. Hagia Sophia, Istanbul. Plan at gallery level
(after Mainstone R. J. Hagia Sophia: Architecture, Structure and Liturgy of Justinian's Great Church. New York, 1988, p. 272)



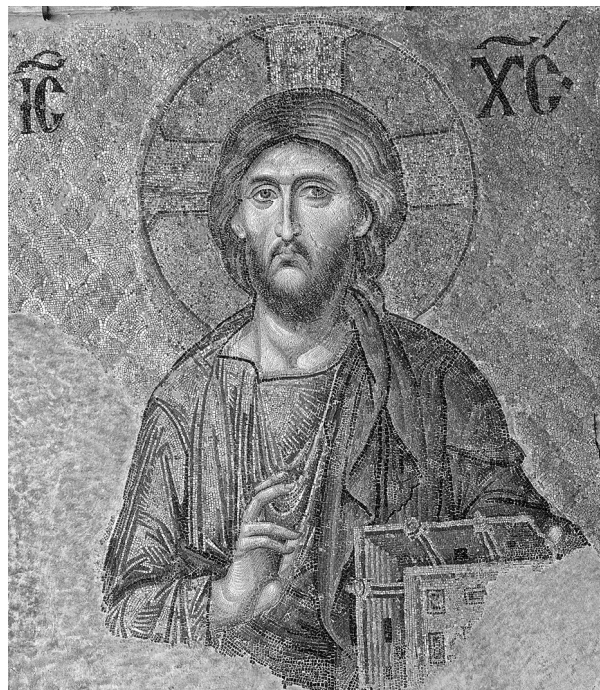
6. Hagia Sophia, Istanbul. Plan of the floor near the Deesis (after *Whittemore*, Fourth Preliminary Report, fig. on p. 11)



7. South gallery, Hagia Sophia. Drawing by Cornelius Loos (after *Mango C. The Mosaics of St. Sophia at Istanbul*. Washington, DC, 1962, fig. 22)



8. Hagia Sophia, Istanbul. Deesis, front and side views (photo: N. Teteriatnikov; computer generated image: S. Teteriatnikov).



9. Hagia Sophia, Istanbul. Deesis, detail (photo: N. Teteriatnikov).



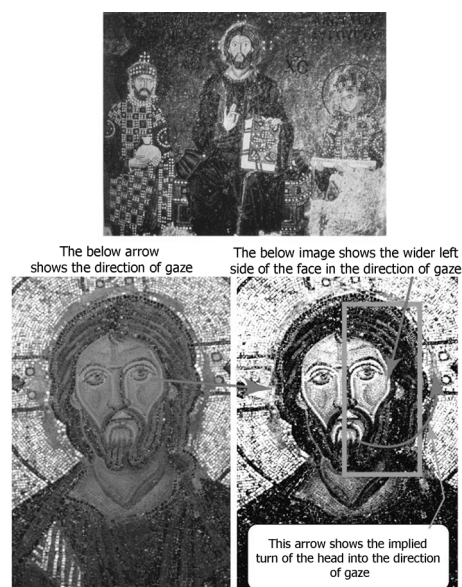
10. Hagia Sophia. Mosaic panels of Zoe and Constantine IX and John II and Eirene (photo: N. Teteriatnikov).



11. Hagia Sophia. South gallery, east end, looking east (photo: N. Teteriatnikov).



12. Hagia Sophia. Mosaic panel of Zoe and Constantine IX
(photo: Dumbarton Oaks, Image Collections and Fieldwork Archives, Washington, DC).



13. Hagia Sophia. Mosaic panel of Zoe and Constantine IX, general view and details
(photo: Dumbarton Oaks, Image Collections and Fieldwork Archives, Washington, DC).



14. Hagia Sophia. Mosaic panel of John II and Eirene (photo: N. Teteriatnikov).



15. Hagia Sophia. Mosaic panel of John II and Eirene (photo: N. Teteriatnikov).



16. Hagia Sophia. Apse mosaic
(photo: Dumbarton Oaks, Image Collections and Fieldwork Archives, Washington, DC).



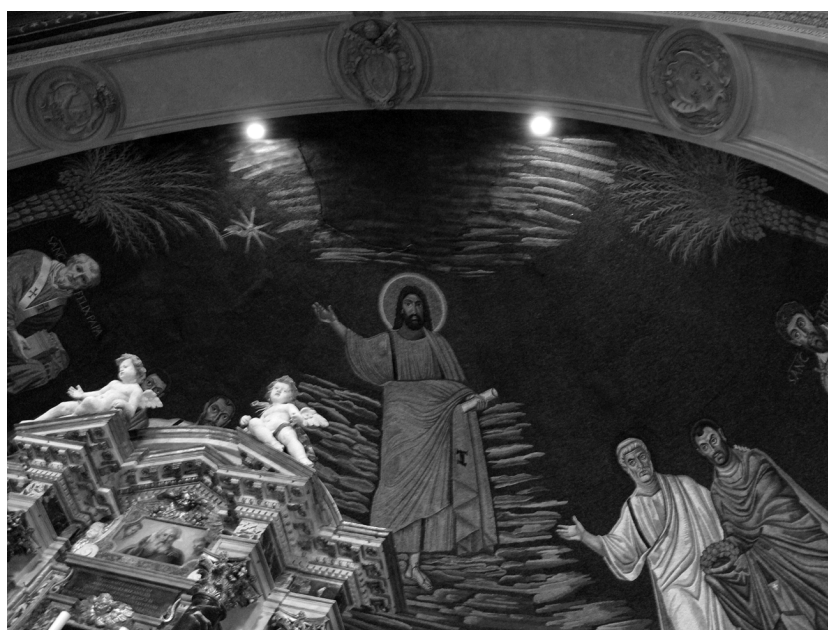
17. Hagia Sophia. Apse mosaic (photo: N. Teteriatnikov).



18. Hagia Sophia. Apse mosaic
(photo: Dumbarton Oaks, Image Collections and Fieldwork Archives,
Washington, DC).



19. Hagia Sophia, Kiev. Apse mosaic
(after Logvin, *Sofia Kievskaja*, fig.18).



20, 21. Church of SS. Cosmas and Damian, Rome.
Apse mosaic (photo: H. Dayton).