THE ARCHITECTURE OF SUBJECT

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Abstract. *This essay defines material and symbolic implications of linear perspective in modern architecture. First is seen as aesthetical method, which appears in architectural drawings since beginning of European Renaissance. It represents graphic system of creating illusion of spatial depth on flat surface. Second refers to perspective in figurative sense. It symbolizes perception of a subject: the capacity to view things in their true relations or relative importance. In terms of vision, it characterizes a visible scene, a mental view or prospect. Modern culture is, accordingly, the culture of perspective. We can presuppose the connection between subject of architecture and linear perspective due to their consistent development in early modern period. The essay proposes that rising of designing subject is gained out from alienation from real space. In systematic representation, such as linear perspective, places are exhausted in defining their positions. Therefore it (representation) presents purely functional, not essential reality. Nonetheless, perspectival system raises arts to the status of sciences. It rationalizes individual performance to extent it becomes a basis of modern, empirical vision of space. Finally, it objectifies subjective viewpoint and, therefore, creates modern subject.*

Key words: *position, projection, subject, perspective, space*

1. Construction of Space

Linear perspective which appears in European Renaissance architectural drawings can be observed mainly as instrument of aesthetics. In that case, it introduces a graphical system for creating an illusion of spatial depth on flat surface. Essence of the word derives from the Latin verb *perspicere*, meaning: *examine*, *observe* and *see thought*. However, term to which Dürer assigns meaning of *seeing through* in last section of his *Four Books on Measurement* - "*perspectiva*" - originates from Medieval Latin word, signifying *optics*, namely, *a science of optics*. [1] Therefore it allows us to refer to perspective in figurative sense. Moreover, it enables us to outline metaphorical implications of mathematical representation of space that overcomes analysis of early

modern blueprints. It symbolizes perception of a subject: the capacity to view things in their true relations or in their relative importance. In terms of individual vision, it characterizes entirely visible scene, mental view or prospect. Modern culture is, accordingly, culture of perspective. Erwin Panofsky emphasizes this fact in his book Perspective as a Symbolic Form, when, by adopting Dürer's definition, he incites possibility of speaking of fully perspectival overview of things:

> *"(...) not when mere isolated objects, such as houses or furniture, are represented in shortening, but rather only when the entire picture plain has been transformed into a "window," and when it is meant for us to believe to be looking through this window into a space."* [2]

Dürer defines perspectival image as: *(...) planar, transparent intersection of all those rays that fall from the eye onto the object it sees.* [3] But, because of relative position of visual rays, in order to set correct size of each figure appearing on the intersecting surface, author of perspectival image has to previously develop entire system in plan and elevation. According to Panofsky, in the picture constructed this way, the following laws are valid:

> *First, all perpendiculars meet at the so-called central vanishing point which is determined by the perpendicular drawn from the eye to the picture plane. Second, all parallels, in whatever direction they lie, have a common vanishing point. If they lie in a horizontal plane, then their vanishing point lies always on the so-called horizon, that is, on the horizontal line through the central vanishing point. If, moreover, they happen to form a 45-degree angle with the picture plane, then the distance between their vanishing point and the central vanishing point is equal to the distance between the eye and the picture plane. Finally, equal dimensions diminish progressively as they recede in space, so that any portion of the picture – assuming that the location of the eye is known – is calculable from the preceding or the following portion.* (1991: 28)

1.1. Introduction: invention of vanishing point

Invention of vanishing point was last accomplishment of Gothic painting, such as the invention of whole graphic system of linear perspective was the first achievement of Early Renaissance. From the point of view of architectural discipline of today, transitional period remains utterly vague. As one can perceive, there is a major difference in position regarding Gothic and Renaissance architect, although the notion of architecture was still firmly linked to art of painting and sculpture. We are still not deprived of optical tools for perceiving Gothic buildings as narratives rather than as forms. But we are not able of interpreting position of Gothic architect, as such is, since it is visible from our perspective only as the one of the anonymous master builder.

Contemporary philosopher Peter Sloterdijk suggests that in Late Gothic period, the ontological framework of western art, namely painting, was radically shifted. He refers to this as *"substitution of its truth model"* — from *"eidos"* (Greek: *εἶδος*; type, species, item, genre) into *"skini"* (Greek: *σκηνή*; tabernacle, stage, scene, tent), or from the *archetype* into *pre-scene* — which was, according to Sloterdijk, carried out by artists themselves. As he cites:

"In a world historical act of sensualizing and dramatizing its truth relation, European west exchanged primal images for primal scenes. As a result of this fundamental semio-political decision, European artists regained sites of moving, lively world for representation as scenes capable of expressing the truth. (...) At the same time for the Eastern Platonist, monarchist and hierarch, the striving for truth could only ever be interpreted as a homeward journey from the image to the archetype." [4]

We are able to recognize this transition in arts. For example, Italian painting in-between periods of Late Gothic and Early Renaissance responses to multitude of Post-Scholastic and Neo-Platonic influences within altered *truth model*, from *visual* into *pictorial*. But, from point of view of architecture, no transitional examples can be found. Rather we can recognize separation of these two periods, although we can assume that 'transitional' phase begins when personal name of author can be assigned to building. For example, former Masters of the Works of Florence Cathedral, one after the other — Arnolfo di Cambio (c. 1240-1300/1310), architect of old basilica of *Santa Maria del Fiore*, then Giotto di Bondone (1266/7-1337) who succeeded him by adding famous *Campanile di Giotto*, then his successor Andrea Pisano (1290-1348) and Francesco Talenti (c. 1300-aft. 1369) who succeeded Pisano in 1351, completing two middle levels of Giotto's Campanile, and two doorways, respectively in the north and south sides of the Florentine *Duomo* — are all recognized as Gothic masters, regardless of possible novelty in their style. Generation younger Filippo Brunelleschi (1377-1466), generally well known for developing technique for linear perspective and for building the dome of the Florence Cathedral, becomes a key figure in architecture, recognized to be the first modern engineer, planner and sole construction supervisor. Heavily depending on mirrors and geometry, his formulation of linear perspective governed pictorial depiction of space until the late 19th century, but also had the most profound and quite unanticipated influence on the rise of modern sciences.

Therefore architecture, apart from painting, recognizes specific moment that consolidates beginning of early modern existence – moment that reveals first appearance of authenticity within both architectural structure (of *Duomo*) and person (of Brunelleschi). At most, it announces the authenticity of Quattrocento, which remains unique and truly Italian style, in contradiction with generic character of Late Gothic. Renaissance architecture implements visual symbolic order which is, in analogy, contradicted to pictorial. Furthermore, it (Early Renaissance architecture) reflects Neo Platonic cosmological model as opposite to Aristotle's vision of Cosmos that was, by means of Thomas Aquinas's *Summa Theologica* implemented into Gothic structural principles. Nevertheless, it first reflects capacity of modern architecture to embody and impersonate models of existence. It therefore distinguishes from other art forms that, according to Sloterdijk, became more of a *"spotlight on visualization of our views of the existent through the medium of elevated scenes."* Does this mean that modern architecture represents a Platonic kind of practice? This question relates to two of its features: one, of reproducing archetypes and transposing them within structural order, and other, of reflecting the image of order onto the whole of interior space, and vice versa. Even today, instead of making new *"semio-political decisions"* in reverse, which would enable new practices to *"regain sites of moving"* and *"the places capable of telling the truth",* the contemporary discipline of architecture is holding on abstract capacity of object and visual totality it rediscovers in its virtual graphic representation. (2001: 103)

Sienese school, as noted by Sloterdijk, originally carries out image-typological opposition: *"eidos vs. novella scene."* (2001: 104-105) It captures two opposing ideas of form and, accordingly, reflects two visions of heaven. Basic form of Gothic architecture is juxtaposition: form of open sequence, partial coordination and expansion. Its structure is atectonic and further characterized by mobility of scenes, immediate impressions, heterogeneous style, a-subjective viewpoint and thematic material in particular. Basic form of Quattrocento architecture is unity: closed geometric form of subordination and division. Renaissance architecture is tectonic and further characterized by vivid clear idiom, simple and homogenous shape, subjective viewpoint, uniformity, smoothness, limitation and order, totality of impression. The *Sienese school* stands in a way of prejudices that these two morphologies are mutually exclusive.
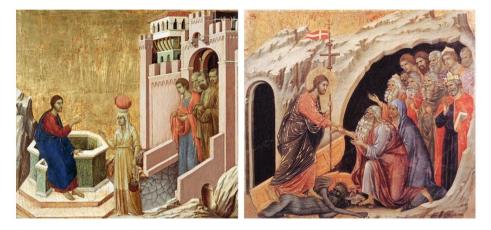

Fig. 1 Duccio di Buoninsegna: *Christ and the Samaritan Woman and Christ in Limbo*
(*Google Art Project*, www.google.com/culturalinstitute/project/art-project)

Father of *Sienese school*, Duccio di Buoninsegna lives and creates in late 13th and early 14th centuries, that is, after time of Byzantine influence, in a progressive Scholastic period with spontaneous, personalizing tendencies. The spaces of his paintings result from what seems to be irregular construction of linear perspective. Presumably, he uses some linear extensions, but not in terms of fully systematical representation of space. Rather he chooses places of extension, that is to say, he selectively applies technique of perspective in order to exemplify interior spatial narratives. He literally extends spaces of holes, wells, doors, windows, fissures of caves in stone hill landscapes. Therefore he includes them as objects of interior shape and meaning within regularly paraphrased biblical scenes. With the anterior movement of horizontal plane he achieves that interior space, homogenous dark space unified behind scenes, overcome natural images of openings. (Fig.1) There is also a certain hierarchy of places, and certain geometry that adds new narratives to his scenes, but as well, there is unifying naturalness by which all the places together, with those extended places, are made equal under unique (namely, renaissance) sky-light.

Duccio was certainly a master in *perspective*, as he drew it out of plane by non-systematical progression from *vanishing axis* to *vanishing point*. Within the next generation of artists in *Sienese school*, a curious division set place. Neo Platonic need for

clarification and systematization of his perspective was keenly felt, but it grew from utterly different roots. There were those who developed it back to pure parallel construction. On other hand, others systematized the method Duccio had only applied to central section of the ceiling; they now subjected it floor as well. It was above all Lorenzetti brothers who took this important step. According to Erwin Panofsky, Ambroggio Lorenzetti's *Annunciation* of 1344 is one of the most important pictures of this period. The visible orthogonals of ground plane are for the first time oriented toward single point, undoubtedly with full mathematical knowledge. It is therefore the first representation of actual infinity at very dawn of perspectival revolution. Panofsky emphasizes how *"discovery of vanishing point is, in sense, discovery of infinite itself"* —

> *"The picture is equally important for the completely new meaning it bestows upon the ground plane as such. This plane is no longer merely the lower surface of a 'space box' closed on the right and left and terminating with the edges of the picture, but rather the ground surface of a strip of space, which, even if still bounded at the rear by the traditional gold ground and in front by the picture plane, can nevertheless be thought of as extending arbitrarily far to either side."*

Ground plane now permits observer to read not only sizes but also distances of bodies arrayed on it. Checkerboard tile, although it appears as motif (and not exploited in this sense), in fact, runs under all the figures and thus becomes the index for spatial values. At this point, kind of representation which was blocked since antiquity – the conceptual view, namely, the vista of *"looking through"* – once again becomes section of infinite space, only *"more solid and integrally organized"* that its antique version. (1991: 58) Duccio and Giotto still represented figures as they were separated from background by spatial void, similar to niches which separated sculptures from unifying masses that embodied inner spaces of Gothic cathedrals. We will see this empty space soon gradually superseded with infinitely extended void: the homogenous, graphical abstraction from real space, centered in an arbitrary vanishing point.

It is now time to introduce Filippo Brunelleschi from Florence, representing first authentic architectural figure at threshold of early modern era. Not only that he created most beautiful and, allegedly, most advanced structure of time, but he reinvented social and cultural position which was yet sleeping since antiquity, along with subjective conception space. Architect, referred to as subject of architecture, is one who deals with conceptions of space and, according to Vitruvius, materializes them at real site, turning ideas into reality. Modern architect, in analogy with modern construction of space, is *"more solid and integrally organized"* feature comparing to the one from the ancient Roman period. It is of great symbolic significance that, before his other merits which include *Duomo* of Florence, Filippo Brunelleschi is acknowledged inventor of *"costruzione legittima"* of linear perspective. Unfortunately, both his original panels have been lost, so it has never actually turned out whether he used in his experiments famous drawing with model of plain and central point. Leon Battista Alberti has documented that horizontal shortenings of tile-floors were at his time still performed by reducing intervals for third. He was apparently first who, in his essays on architecture, had established regular geometric pattern, by using diagonal cross-sections of the floor-plain. Despite Alberti's effort to discredit him, Brunelleschi has remained known as official founder in the matters of perspective. On the other hand, Brunelleschi has performed his experiments at most crowded spot of Florence, *Piazza San Giovanni*. Therefore the whole

of city was there to witness, if not the success of initial drawing then, more importantly, its outcome - the drawing of Baptistery that had been identically matching to its real image from the spot.

1.2. Model of naturalness

Architectural position that was achieved by efforts of Brunelleschi is much closer to position of architects of Modernist movement that we well know, than to position of Gothic Masters after whom he had actually succeeded. Why is this so? It always falls in the eye that, if Brunelleschi and Le Corbusier are such professional characters which correspond to each other, that this is owed to sudden revelation in rediscovery of antiquity. Anyway, paragon of naturalness that prevailed in Italian Renaissance, as Arnold Hauser interprets in his Social History of Art, is greater a legacy to years of Scholastic artistic inquest than we can possibly imagine. In transition into Renaissance, Ambroggio Lorenzetti's *Annunciation* obviously announces fundamental difference where nature is no more seen as phenomena to be reflected, nor is the art an only possibility of human being to give it unity and meaning. The remarkable thing about Renaissance, as Arnold Hauser puts it, is not the fact that artist became observer of nature, but that work of art became *"study of nature."* He also suggests that instant shift from mythical space to empirical reality is rather modernistic allusion concerning the attitude to scientific discoveries. As cited:

> *"(...) the Renaissance discovery of nature was an invention of nineteenth-century liberalism which played off the Renaissance delight in nature against the Middle Ages, in order to strike a blow at the romantic philosophy of history. The doctrine of the spontaneous naturalism of the Renaissance comes from the same source as the theory that the fight against the spirit of authority and hierarchy, the ideal of freedom of thought and freedom of conscience, the emancipation of the individual and the principle of democracy, are achievements of the fifteenth century."* [5]

Coming into sight in Late Middle Ages, Italian city-states were generally associated with emergence of humanism, as paragon of naturalness in culture of thirteenth century. But, following Arnold Hauser's suggestion about Italian Renaissance, we might presuppose that humanism wasn't known in strength of its 19th century form. Latin term *humanitas*, meaning *humanity*, predates this form, though it didn't have so precise a meaning. [6] Renaissance humanists mostly favored Aulus Gellius (c. 125– c. 180), Latin grammarian who supported old Roman usage of word, equivalent to Greek παιδεία (*paideia*), meaning education and training in liberal arts. He was radically opposing more common usage, equal to Greek φιλανθρωπία (*philantrophia*), which meant friendly spirit and good-feeling towards all men without distinction [7]. Cicero insisted on using both senses of the word, as so did his near contemporaries, suggesting that:

> *"(...) language allied with reason provided the most civilized social form - life together in concord and harmony under the rules of law."* [8]

Both Latin usages of *"humanity"* were known to thirteenth century scholar, but not in our naturalistic and scientific sense of world. Although Petrarch is identified as first humanist by 19th century historians, what seems to be crucial for his (Petrarch) anticipation of antique humanity is not his conception of natural forms, but rather his representation of human figure which announces strengthening of human constitution. (Fig.3)

It is common belief that antique civilizations used scientific knowledge of linear perspective which was either abolished or forgotten in Early Middle Ages, although this theory had never found proper stronghold in material sources. For example, regarding Roman fresco painting, historians relay on idea that ancient Romans had only imperfect or rudimentary usage of perspective which is often compared to that of *Sienese school.* During last decades of 20th century, these assumptions were proven as wrong, moreover, dangerously superficial. There is no doubt that ancient Romans had only a precise knowledge of perspective, but the question is what form of perspective did they use? Art theory of 20th century attempts to prove that visibility of things is different from view of things in perspective. According to Nietzsche:

"Mathematics would certainly have not come into existence if one had known from the beginning that there was in nature no exactly straight line, no actual circle and no absolute magnitude." [9]

1.3. Grounding of 'natural' forms

After *"costruzione legittima"* was established, third decade of 15th century enters the golden age of forming. Until this age, in Florence, antique influences were vague and indefinite, mediated by byzantine perspective. It was not before 1420-ties that any consolidated models took form around site of Florence Cathedral. Around that time, Brunelleschi was already famous because of linear perspective system he developed and used for purpose of study of ancient buildings during his stay in Rome. It is not known exactly how long Filippo remained in Rome or when precisely he had left, but his staying there was one of the first examples of new kind of quest, indispensible for the artists to come. As if he knew, soon enough, new pilgrims of all kinds would overwhelm sites of old Rome for either sketching artifacts or seeking relics, but in all, taking inspiration from ruins. Many architects have followed Brunelleschi's footsteps. We will remember famous *Le Voyage d' Orient*, from 1911, by Le Corbusier: voyage that helped him rediscover architecture as *"the magnificent play of forms and uniform system of the mind."* [10] Concerning Rome, since 1420-ties, unearthing pagan remains was no longer considered "a bad luck". The city that was once haunted now opened her doors; in next hundred years we will see its image utterly transformed.

Within this half of century, since completion of Brunelleschi's dome of Santa Maria del Fiore, Roman antiquity had abruptly become matter of thought and concern of Renaissance masters. Elements of buildings, their proportions, their compositions and articulations were reestablished within new frameworks – frameworks which had so little to do with antique that difference between two Worlds, antique and modern, would soon become a gap to be buried. This fissure was filled with new solidity with book printing development, which announced emergence of theory and knowledge in form of extension of everyday life. First precedent in theory of architecture was made by Leon Battista Alberti who also wrote poetry, literature and philosophy and investigated in languages and cryptography. He was first theorist to explore manuscript *De architectura* (*On architecture*) by ancient architect and engineer Marcus Vitruvius Polio. This work which was dedicated to Roman Emperor Augustus and which is known today as *De architectura libri decem* (*The Ten Books on Architecture*) is only book on architecture which survived from the classical antiquity.

The invention of the printing press effected Europe immediately: within only a few decades, from single shop in Mainz in 1453, it spread around 270 European cities out of which 77 locations were situated only in Italy. [11] Italy became center of early printing. Accordingly, the second known major book on architecture soon appears. It is *De re aedificatoria* (*On the Art of Building*), reformulation of *Ten Books* written by Alberti after 1452. It was also first printed book on architecture, published in Florence in 1485, only one year before original issue of *Ten Books* was published in Rome [12]. Generation younger Piero della Francesca by 1474 published *De Prospectiva pingendi (On the Perspective of painting)*, first study written in 15th century solely on matters of perspective.

Development of joint space among people was starting point for all cultures. These forms of space are built into notion of architecture. First of them is representing earth before discoveries, before subject and before event - forming of great interior. It is formed like primal hut: shared domestic space around common hearthstone. Second refers to chaotic and external conditions of such interior, inflicted by natural flows. It represents first form of human self-provision constructed by group that found itself in estranged and impossible surrounding. Perfect metaphor of such container is *Arca Noe* from biblical Deluge. (Fig.2,3) Nave (from Latin: *navis*) represents safe, artificial home, with artificially selected natural content. City walls have identical symbolic purpose. They announce constructed and sealed from within, an independent world of human law and order.
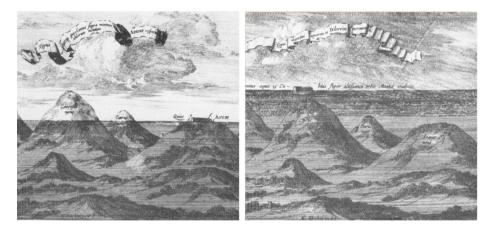

Fig. 2 Athanasius Kircher: *The Deluge, Arca Noe, p. 126.*
[Godwin, J. (1979) *Athanasius Kircher: A Renaissance Man
and the Quest for Lost Knowledge.* London: Themes and Hudson.]

Alberti stresses this in Seventh book of his *"treatise,"* *De re aedificatoria*: city walls have always been dedicated to gods whose protection was needed, because of the common belief that human powers could not protect assets of mortals. Either because of their-own negligence, or because of envy of their neighbors, cities are, *"like ships at sea,"* always left to chance and exposed to various dangers. [13] In political sense, transitional Late Gothic, or so to say Post Scholastic period was nothing but theological adaptation to *citizenship*, by people transitioned from being subjects of monarch to being citizens of city (and later to nation). Early Renaissance begins when notion of citizenship

is already idealized. Architecture of 15th century Florence (as well as 16th century Europe) corresponds with this abstract concept of citizenship which no longer signifies submissive relation to lord, but rather indicates bond between person and state, in fairly abstract sense of appropriating rights and duties. Alberti's description is reaching this sensitive place of cities' self-animation through architecture. Brunelleschi's dome for Florence Cathedral is admired as evidence of city's unique creative energy. Moreover, it follows metaphoric example of Pantheon, seen as single edifice symbolizing mutual success of civic politics, theology and architecture (hereby recognized as joint of arts and sciences). Therefore linear perspective raises arts to status of science, namely, to acknowledge the architecture of nature. At this point, it is important to understand that Scholastic *vision of nature* is already superseded by Neo Platonic *conception of nature*. In other words, from standpoint of Alberti, nature is understood as creative process, *natura naturans*, rather than nature understood from deductive observation, *natura naturata*. Linear perspective therefore emphasizes visualizing of what may not be visible. Philosophy of rationalism, as Arnold Hauser suggests, engages it (perspective) otherwise.
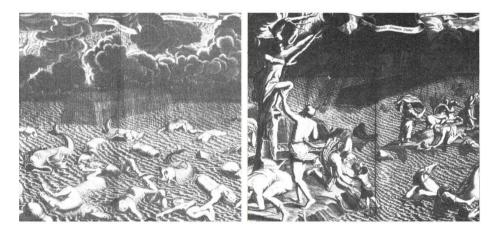

Fig. 3 Athanasius Kircher: *The Deluge, Arca Noe, p. 126.*
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2. Subject and Perspective

Naturalness from this frame of reference was created at the beginning of the fifteenth century — it was created and not given category, and it was followed by notion of visual independence of painting, sculpture and architecture. This is precisely where modern architecture identifies with objective notion of space. It represents space as *"archetype of our views"* rather than seeing space as *"medium of elevated scenes."* High Renaissance architectures' 'idea of space,' though rationalized by classicism and formalized by Neo Classicism, corresponds with functionalism of Modernist movement on basis of its internal authenticity. Brunelleschi realized himself as role model for architects in both structure and person, thus interconnected with unique, solid identity. What this figure proves to us is that new faith in power of individual, confident in capacities of his own, is

ever since in history of Modernity reflected in purified tectonics of space. Interiority of such form is not physical but phenomenal and symbolic, producing abstract identity alienated from real space.

2.1. Systematic abstraction

Idea of authenticity of vision is unfolding within Panofsky's understanding of perspective as symbolic form. As he assumes:

"Linear perspective functions as systematic abstraction from the structure of our psycho-physiological space (...) due its intended purpose to realize, in the representation of space, precisely that homogeneity and boundlessness foreign to our direct spatial experience. In a sense, it transforms psycho-physiological space into mathematical. (...) It negates the differences between front and back, between right and left, between bodies and intervening ("empty") space, so that the sum of all the parts of space and all its contents are absorbed into a single 'quantum continuum.'" (1991: 31)

In order to guarantee fully rational space, linear perspective assumes two bold abstractions from reality - if by reality we suppose "*our actual, subjective, optical impression.*" The first is position of the eye, which is static; the second is a plane on which the image is projected, which is infinite and homogeneous. (1991: 28-29) According to Panofsky:

"(...) Perception does not know the concept of infinity; from the very outset it is confined within certain spatial limits imposed by our faculty of perception. And in connection with perceptual space we can no more speak of homogeneity than of infinity. The ultimate basis of the homogeneity of geometric space is that all its elements, the 'points' which are joined in it, are mere determinations of position, processing no independent content of their own outside of this relation, this position they occupy in relation to each other. Their reality is exhausted in their reciprocal relation: it is a purely functional and not at all substantial reality. Because, fundamentally, these points are devoid of all content, because they have become mere expressions of ideal relations, they can raise no question of diversity in content. Their homogeneity signifies nothing other than its similarity of structure, grounded in their common, logical function, their common ideal purpose and meaning. Hence, homogeneous space is never given space, but space produced by construction; and indeed, the geometrical concept of homogeneity can be expressed by the postulate that from every point in space it must be possible to draw similar figures in all their directions and magnitudes. Nowhere in the space of immediate perception can this postulate be fulfilled. (1991: 30)

Positions and directions are never equal, but each has their own modalities and values, which is why there is no homogeneity in visual space, as there cannot be one in tactical.

2.2. Retinal image

The linear perspective neglects the fact that we do not see with the one fixed eye, but two mobile eyes determine our spheroid field of vision. Miraculous stabilizing tendency of our reason, which provides connection between senses of sight and touch, attributes

unambiguous size and shape to objects and does not record distortion which they suffer on retina. Linear perspective ignores key factor that retinal image, quite independently from its later psychological interpretation and fact that eyes are moving, is not projection on plane, but on concave surface of a sphere.

Basic difference between retinal image and its planar projection in linear perspective is that latter suffers substantial marginal distortions. This difference is of formal nature: where perspective develops straight lines, we actually see convex curves. Even verticals are, to smaller extent, subjected to this curvature. According to Panofsky:

"(...) If even today only a very few of us have perceived these curvatures, that too is surely in part due to our habitation – further recognized by looking at the photographs – to linear perspectival construction: a construction that is itself comprehensible only for a quite specific, indeed specially modern, sense of space, or if you will, sense of the world." (1991: 33-34)

In civilization governed by conception of space expressed by strict linear perspective if curvatures of our spheroid, optical world have to be discovered, it obviously happens in accordance with epoch which also seen perspectively, only not in linear perspective. We assume that antique architect was familiar with such curvatures and, moreover, that he took them for granted. In ancient Greek architecture we find all the time that straight lines are represented as curved and vice versa: in order not to bend, Doric columns are subjected to *entasis*; *epistyle* and *stylobate* are built as curved in order to avoid the impression of sagging. Curvatures of Doric temples attest to practical consequences of such findings. Optics which brought them to fruition must have been antithetical to linear perspective, and even more true to factual situation.

2.3. Euclid's Eighth Theorem

Because it had based its field of view on a sphere, the optic of antiquity had always, and without exception, expressed itself within the apparent magnitudes. Sizes of objects in perspective were determined not by relative distances from eye, but by latitudes of angle of vision. In fact, as cited by Panofsky:

"Euclid states that the apparent difference between two equal magnitudes perceived from unequal distances is determined not by the ratio of these distances, but rather by the far less discrepant ratio of the angles of vision." (1991:38)

On basis of its radical opposition to doctrine of Linear Perspective, Euclid's Eighth Theorem was amended in Renaissance until it lost its original meaning. Probably there was felt a substantial contradiction between Euclid's *pespectiva naturalis* (which sought to formulate mathematical laws of natural vision) and *perspectiva artificialis* (formulated later, requested to provide method for constructing three-dimensional images of two-dimensional surfaces) which could be resolved only by abandoning the angle axiom. Recognizing it would mean exposing perspectival system to impossible task, since sphere cannot obviously be unrolled on surface. For this reason, Vitruvius's definition of perspective had never been clarified.

According to Vitruvius, there are three basic architectural layouts necessary to explain idea and character of project: *ichnographia* or plan, *orthographia* or frontal section and *skinographia* or representation in perspective. As Vitruvius defines it (perspective):

"Stenography is the method of sketching a front with the sides withdrawing into the background, the lines all meeting in the centre of a circle." [14]

In Latin, "*Omnium linearum ad circini centrum responses*" also means "*the meeting place for all directions toward the center of the compass."* (1960: 13) His "*meeting point"* can't possibly be equal to vanishing point (as consolidated vanishing point never appears in antique representations). Therefore it is probably assigned to eye of beholder. Assuming that arc in projection probably represents line (in linear perspective, line indicates position of picture plain) we might conclude that instead of translating points onto plane, here spherical curvature of eye is taken into account. Therefore Vitruvius's system is representing simplified stereographic projection. As a result, parallel lines do not meet at single vanishing point but rather they converge on vertical axis, producing recognizable "fish bone" pattern like. Therefore there is no absolute vertical position of horizon. Rather, it is defined with expansion of vertical angle. (Fig.4)
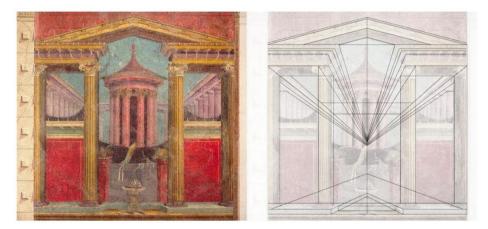

Fig. 4 Stenography: the "fish bone" pattern
(interior wall at The Villa of P. F. Synistor at Boscoreale,
Pompeii. www.deprisco.it/villasinistore/Alta)

Hellenistic perspective, as seen in this image, emphasizes illusionism of space, while linear perspective emphasizes shape as clear geometric idiom. First obviously allows spontaneity of scenes that subject is never separated from. On the contrary, by naturalistic conception of space, modern subject is separated from intermediate spatial experience. According to this, the Hellenistic art had appreciated not only values of internally motivated bodies, but also graces of their outer surfaces. As Panofsky also notices, Hellenism considered worthy of displaying not only alive but also inanimate nature, not just plastic and nice but usual and ugly, not only solids but also uniting space:

"Yet even the Hellenistic artistic imagination remained attached to individual objects, to such an extent that space was still perceived, not as something that could embrace and dissolve the opposition between bodies and non-bodies, but only as that which remains, so to speak, 'between' the bodies."

Even where Greco-Roman advanced to representation of real interiors or real landscape, this enriched and expanded world was still by no means perfectly unified world. Accordingly, representation is never systematic but aggregate form of space. We see that magnitudes of things diminish as they recede in perspective, but this diminution is never constant. Indeed, it is always being interrupted by mal-proportioned figures, figures *not to scale*. Distance is being represented by intervening upon form and color with such bold virtuosity that effect of these wall-paintings is parallel to modern impressionism. Yet they never achieve unifying lighting (Fig.5):

"Precisely here it becomes clear that antique impressionism was only a quasi impressionism. The modern movement always presupposes that higher unity, over and above empty space and bodies; as a result its observations automatically acquire direction and unity. This is how impressionism can so persistently devalue and dissolve solid forms without ever jeopardizing the stability of space and the solidity of the individual objects; on the contrary, it conceals that stability and solidity. Antiquity, on the other hand, lacking the domineering unity, must, so to speak, purchase every gain with a loss of corporeality, so that space really seems to consume objects. This explains the almost paradoxical phenomenon that so long as antique art makes no attempt to represent space between bodies, its world seems more solid and harmonious than the world represented by modern art; but as soon as space is included in the representation, above all in landscape painting, that world becomes curiously unreal and inconsistent, like a dream, or a mirage." (1991: 43)

Fig. 5 Wall decoration scenes from the *The Villa of Livia*, Rome.
(Latin: *Ad Gallinas Albas. Roma. http://www.villadrusilla.it/*)

Representation of real depths based on stereographic projection requires lot of simplifications for practical reasons. In accordance to factual situation, parallel lines partially meet correct angle, but partially are portrayed as parallel or even fractured. This way of representing spatial depths suffers from instability and internal inconsistency. On the other hand, system of linear perspective, with plain and vanishing point, transforms all actual depths into apparent shapes and sizes appropriating perspectival view as view in general. For this consistency of image, linear perspective was so stubbornly maintained

in modern methods of spatial representation. In Early Modern drawings, perspective thus breaks out as purely mathematical problem, but closely related to question of style, if not of artistic value. Fact that these two forms of representation, *pespectiva naturalis* and *perspectiva artificialis*, were distinct in antiquity only proves that systematicness was as incomprehensible to philosophers, as was unthinkable to artists. None of many ancient theories of space reduces it to relations of height, length and width. Otherwise, distinction between front and back, here and there, body and non-body would have spilled into some kind of extension of the actual body, into notion of body taken in general. (Fig.6)

Fig. 6 Stereographic Map: *The Tree of Life 1-2*

3. ACTUAL INFINITY

According to Alberty, perspective *"contains a divine force."* This sentence presupposes metaphorical and dialectical quality of linear perspective with single vanishing point. How does this composition work within visual narrative? For example, Leonardo da Vinci's *Last Supper* is evidently constructed in manner that all orthogonal lines converge at the head of Christ. This apparently rational, empirically evident space is easily experienced as continuation of viewer's space. Trouble sets in when one realizes that point of recession is defined by lines that recede almost to infinity. Are we meant to understand that what seems near is identified with infinity?

Understanding of this is rather complicated, but here are the facts: according to Alberti, perspective is mirrored, transparent intersection of all those rays that fall from eye onto object it sees. Representational surface is, therefore, juncture between finite world of seeing which is characterized by pyramid of vision and the infinite world of seeing through (divine vision) implied by the pyramid of perspective.

Abstract thought which turned aggregate to systematic space also broke off Aristotelian worldview and cosmic structure it presupposed: spherical celestial body with earth in its centre, wrapped cozily in concentric sky structure. This Cosmos was perfectly integrated whole: geocentric and geostatic, finite, qualitative and hierarchically differentiated. There was no space but only places. Matter and Form never separated from substantiated form. Being and Knowing always interflowed. All the Becoming had been explained by Great Chain of Being and Being itself (God, the Unmoved Mover).

Result of this cosmic collapse was infinity as we know it: infinity not only prefigured in God, but actually embodied in empirical reality. Great logicians of fourteenth century managed to reinvent barrier, which they thought was solid and impenetrable, around Earth and Sky. Will see it declined, not all at once, rather little by little, in two centuries of European Renaissance. Panofsky writes:

"Actual infinity, which was for Aristotle completely inconceivable and for high Scholasticism only in the shape of divine omnipotence (...) has now become "natura naturata." The vision of the universe is, so to speak, de-theologized, and space now becomes a continuous quantity, consisting of three physical dimensions, existing by nature before all bodies and beyond all bodies, indifferently receiving everything. No wonder that man like Giordano Bruno now outfits this world of special and infinite, and thus of thoroughly measurable, this world which, so to speak, outgrew divine omnipotence, with an almost religious sublimity of its own; he invests it, along with the infinite extension of the Democritan kenon (void), with the infinite dynamic of the neo-platonic world-soul. And yet this view of space, even with its still-mystical coloring, is the same view that will later be rationalized by Cartesians and formalized by Kant." (1991: 67-69)

Dome of Pantheon symbolized architecture of globe: universe has acquired a form only after the mastery of building realized how to approach to the shape of the universe. Such mastery of building yet has nothing to do with contemporary metropolitan accumulation of facades. On the other hand, linear perspective so has. And so far only 19th century glass utopias have managed to open way to different architectural and philosophical forms in which oppositions between centralized and decentralized, inner and outer space finally lost their symbolic function. We only yet have to learn what it means to design free from ancient morphological models of heaven and nave. Modern people in general, as people who had de-constructed celestial dome, yet have to change their attitude towards safety of form.

Fig. 7 Stereographic Map: *The Stereographic Round*
(3M3, Gallery Kolektiv, 2015)

According to Michel Foucault:

"We are in an era of the simultaneous, of juxtaposition, of the near and the far, of the side-by-side, of the scattered. We exist at a moment when the world is experiencing, something less like a great life that would develop through time than like a network that connects points and weaves its skin. (...) In other words, we do not live in a kind of void, within which individuals and things might be located. We do not live in a void that would be tinged with shimmering colors, we live inside an ensemble of relations that define emplacements that are irreducible to each other and absolutely non superposable." [15]

Nonlinear forms are all around us. With further use of digital technology, elements of non-linear projections will open up new spaces for architectural design and design in general. Yet these formations belong to virtual space in which they were created. In real space, as images and items, merely as objects of desire, they encourage endless necessity of production, but remain closed into own structural arrangements. (Fig.7)

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ARHITEKTURA SUBJEKTA

Ovaj rad tumači pojavni i simbolički smisao linearne perspektive u modernoj arhitekturi. Ona se prvo javlja kao estetsko sredstvo, u arhitektonskim crtežima iz perioda evropske renesanse, predstavljajući precizan, geometrijski sistem konstukcije trodimenzionalnog prostora na dvodimenzionalnoj podlozi. U pogledu samog viđenja prostora perspektiva označava opštu ili pojmovnu vidljivost, odnosno transparentnost mentalnog prostora. Po tom osnovu moderna kultura predstavlja kulturu perspektive. Takođe se može pretpostaviti veza između subjekta arhitekture i linearne perspektive na osnovu simultanog razvoja ta dva pojma u periodu rane modernosti. Osnovna hipoteza ovog istraživanja odnosi se na slobodni razvoj projektantskog subjekta kroz njegovo otuđenje od neposrednog prostornog iskustva. U sistematskoj predstavi prostora putem linearne perspektive pojam mesta se iscrpljuje definicijom pozicija. Takvom predstavom se ispoljava čisto funkcionalna, ali nikako i suštinska stvarnost. Pored toga, perspektivni prikaz obezbeđuje naučni status umetnosti, ali i racionalizuje subjektivni postupak koji postaje osnova empirijskog viđenja prostora. Najzad, objektivizujući subjektivnu poziciju, perspektiva stvara modernog subjekta.

Ključne reči: *pozicija, projekcija, subjekat, perspektiva, prostor*