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Theories of Perception in Renaissance Humanism

John Shannon Hendrix

The relation between the sensible form and the intelligible form in perception and intellection is similarly described as a form of love in the *De amore* of Marsilio Ficino in the Renaissance. For Ficino, sensible objects have no connection with each other, or with the perceiver. Without the ordering process of intellection in perception, the sensible world would not exist. Desire for God, or harmonious order in the world, is a desire for human reason in relation to the sensible world. In the first speech in *De amore*, made by Giovanni Calvalcanti, a friend of Ficino's, to explain the speech made by Phaedrus in the *Symposium* of Plato, "turned toward God" (II.2),¹ the intellectual in the soul, *nous poietikos*, "is illuminated by His ray," and the appetite or desire of the intellectual is increased by the splendor of the ray. As the intellectual reaches toward God or cosmic intellect in its desire, "it receives form. For god, who is omnipotent, imprints on the Mind, reaching out towards Him, the nature of all things which are to be created." In perception, the mind creates the form of all things perceived, as the intelligible form, prior to the actual perception, prior to the making of the imprint of the sensible object in the eye, the sensible form.

In the *De amore*, everything which is perceived is painted on the angelic mind, from which are created the forms of all sensible objects, like the archetypal forms which are created by the children of the demiurge of Plato. The forms of things are conceived in the celestial mind, and are called the ideas, as they are in the *Timaeus*. Without the ordering of the sensible world by reason in perception, the world would only appear as disconnected chaos. Such perception is a function of the desire created in mind by reason. The first turning of the essence of mind to God from chaos is the birth of love, the infusion of the illuminating ray of God is the nourishment of love, and the forming of the ideas is the perfection of love. The forms and ideas of the intellect form a *mundus* or *cosmos*, which is the ornament, and the grace of the ornament is beauty. That which is most beautiful in the sensible world is that which most conforms to the forms and ideas in intellect, or the soul for Grosseteste, as the form and idea interact with the imprint of the sensible object in perception, as the soul connects the sensible form and the intelligible form. Love attracts the mind to the beautiful, and allows the mind to become

beautiful, as it becomes more aware of the divine idea. The beauty of the ideas in the mind corresponds to the beauty of sensible objects, because it is the ideas in the mind which form sensible objects. Thus “the mind is turned toward God in the same way that the eye is directed toward the light of the sun,” in which it perceives the colors and shapes of things, which are formed from the inner light, the reflected spiritual light, which is the basis of the imagination, wherein the sensible form is formed, in the spiritual irradiation.

As the mind looks toward the illumination of the divine idea for Ficino, as the intellectual of Grosseteste would be informed by the cosmic intellect, “it is informed with the colors and shapes of things,” to which the sensible world conforms in the process of perception. Perception is a mechanism of the desire of the divine idea, the intelligibles, which order the sensible world, and allow it in turn to be loved by the perceiver. The world soul, the structure of the cosmos, turns toward the same ideas, and its turning is caused by love also. Love is the desire for beauty in *De amore* I.4, for “this is the definition of love among all philosophers,” as the beauty of the sensible world reinforces the beauty of the soul. Beauty is described by Ficino as a three-fold grace which originates in harmonies: the harmony of virtues in souls, the harmony of colors and lines in bodies, and the harmony of tones in music. Harmony in soul is known by intellect, harmony in body is known by proportions in visual perception, and harmony in sound is known by aural perception. It is through the intellect and perception that love is satisfied.

In the seventh speech in *De amore*, by Tommaso Benci, the relation between the sensible form and the intelligible form is explained. The medium by which the form of the idea, the intelligible, is transferred to the imprint of the sensible object or form, is the spirit. In *De amore* VI.6, images of external bodies “cannot be imprinted directly on the soul because incorporeal substance...cannot be formed by them through the receiving of images.” Images cannot be immediately or directly perceived; there must be an intermediary which translates the images in perception, as Plotinus held. The soul, though, “easily sees the images of bodies shining in it, as if in a mirror.” The image can only be a reflection or representation of the idea or intelligible, the image in the soul. The intellect, through the medium of the spirit, corresponds the form of the idea with the form of the *typos* (imprint) of the sensible body, and this operation is called the imagination. Imagination consists of the formation of the *species* in the mind’s eye, which is a representation of the *species* in perception, which is an intellectual representation to begin with of

sensible objects. Such images of the imagination retained in intellect constitute memory.

For Ficino, this process is generated by the desire or appetite of the intellect for the idea. The eye of the soul, or mind's eye, in *De amore*, is "aroused to contemplate the universal ideas of things which it contains in itself," and at the same time "the soul is perceiving a certain man in sensation, and conceiving him in the imagination..." In both parts of this dual operation, love and desire are generated and reflected. While the soul can preserve an image in memory, in the retention of the mnemonic residue, the eye in perception and the medium of spirit, as physical operations, "can receive images of a body only in its presence," and can only reflect it, like a mirror. Once the image is not present, it is lost. The *species* can only be retained, and transformed in the imagination, through the operations of intellect in *virtus intellectiva*. The function of imagination in the soul is dominated by the eye and spirit, and also requires the presence of the *species* or form, and thus can only reflect it as a mirror.

In the *Theologia Platonica* of Marsilio Ficino in the fifteenth century, rays of light projected by the sun emanate in the form of the cone, and are reflected and refracted off of the surface of the agent as *lumen*, corporeal light. Rays of light from the sun pass through a hole in the pupil of the eye, where they are condensed in *virtus* (force, power) at the apex of a cone, and form the homogeneous *species*, and penetrate in the form of the cone into the soul, as the *species* in the form of the cone is reflected by the *virtus intellectiva* or intellectual in the *oculus mentis* (mind's eye) as in a mirror, into the imagination (*phantasia* or *imagination*) of Grosseteste. Ficino describes the cone of light forming the *species* in the *anima rationalis* as a lens or pineal gland, mirroring or imitating physical reality, as for Grosseteste. The cone of light facilitates the *vis aestimativa* in the soul, which judges and measures distances in space in mathematical and geometrical terms, the dimensions given by light. The mechanisms of vision and cognition, in the intromission of light, are modeled on the extramission of light in the sensible world, from the originary spiritual light, *lux spiritualis*, in the illumination of the sensible world by a cosmic, divine intellect, *intelligentia*, as in the *irradiatio spiritualis* of the *intelligentia* of Grosseteste.

As Ficino explained the process in *De amore*, the commentary on Plato's *Symposium*, "When anyone sees a man with his eyes, he creates an image of the man in his imagination," the sensible form, "and then ponders for a long time, trying to judge that image," in the *vis aestimativa*. "Then he raises the

eye of his intellect,” the *oculus mentis* of the *visus interior*, “to look up to the Reason of Man which is present in the divine light,” the intelligible form as illuminated by the *irradiatio spiritualis* in the *intelligentia*, in Grosseteste’s terms. “Then suddenly from the divine light a spark shines forth to his intellect and the true nature itself of Man is understood” (VI.13), the prior and universal cause of Grosseteste.

This is accomplished in a process of vision which combines the intromission and extramission of light in the eye, according to Ficino. In the *De amore*, as rays of light are sent out from the sun in the form of the cone and infused in intelligences, souls and bodies, through the reflected *species*, so rays of light or sparks of light are sent out from the body of the agent, through the eye, which is like a glass window, transparent and shining. The extramission of light from the eye is caused by the desire for the good, as the relation of the sun to sight is the same as the relation of the good to intelligence for Plato, or the *intelligentia* to the *virtus intellectiva* for Grosseteste, and the source of beauty lies beyond the *virtus intellectiva* in the good, or the One of the *lux spiritualis*, where beauty is primal and absolute.

Ficino explained that some animals’ eyes glow in the dark, as from an inner light, and if one is poked in the eye he or she will see a light in the inner eye. Similarly, in the *Enneads* of Plotinus, “At night in the darkness a gleam leaps from within the eye: or again we make no effort to see anything; the eyelids close; yet a light flashes before us; or we rub the eye and it sees the light it contains” (V.5.7).² The extramission of light from the eye is a form of perception in itself for Plotinus; it is “sight without the act, but it is the truest seeing, for it sees light whereas its other objects were the lit not the light.” The mind’s eye is able to see the pure *lumen spiritualis*, incorporeal light, in the irradiation of the cosmic intellect. The inner light, or extramitted light, allows for the truest form of seeing, because it is a form of seeing not dependent on sense reality and material things. Plato described the inner light in the *Timaeus*: “For when the eyelids, which the gods invented for the preservation of sight, are closed, they keep in the internal fire; and the power of the fire diffuses and equalizes the inward motions” (45),³ the motions of the Same in the soul, as in the autodiffusion of the *lux spiritualis* in the form of a sphere.

In the *De amore*, Ficino related that certain great people in history, like the Emperor Augustus, had a light so powerful extramitted from their eyes that it rivaled the light of the sun; the *virtus* of the extramitted rays of light corresponds to the *virtus* of the individual in the intellectual. Rays of light

emanate from the eyes like the shooting of a dart, carrying a spirit or vapor, a *virtus* or *species*, which penetrates the eyes and soul of another person. This can result in the bewitching of a lover, and explains why some people who are not that attractive in body can excite an exceptional degree of love and desire. Love can only happen when the eyes of two people meet, when rays of light pass between them. For Plotinus in the *Enneads*, “it is precisely here that the greater beauty lies,” the beauty of the good, “perceived whenever you look to the wisdom in a man and delight in it, not wasting attention on the face, which may be hideous, but passing all appearance by and catching only at the inner comeliness, the truly personal” (V.8.2), the light of the eyes reflected from the soul. Inner beauty, the beauty of the good, can only be perceived by the soul which itself possesses inner beauty, as divine beauty can only be perceived by the soul in which the intellectual is illuminated by the cosmic intellect.

Leon Battista Alberti, a friend of Ficino in fifteenth-century Florence, conceived of perception as being facilitated by rays of light arranged in a cone or pyramid. In *De pictura*, his treatise on painting, surfaces of sensible objects are defined and measured in the *vis aestimativa* by rays of light which are extramitted from the surface as agent, and form a cone converging in an apex in the eye of the recipient. According to Alberti, the rays of light are the means by which visual matter is translated into intelligible matter, giving it the qualities of proportion and arrangement in geometry and mathematics, in the dimensions given by light. Through light, the sensible form is translated into the intelligible form by the intellectual. Alberti’s definitions of proportion and arrangement come from the *De architectura* of Vitruvius, where proportion is analogous to *analogia* or *eurythmia*, and arrangement is analogous to *dispositione*. Order (*ordinatione*) is defined as the arrangement of the proportion, which results in symmetry, which consists in dimension and distribution (*oeconomia*), the organization of modules or units of measurement in mathematics and geometry. Arrangement (*dispositione*, or the Greek *ideae*) is the assemblage of the modules to elegant effect; proportion gives grace to a work in the arrangement of the modules in their context. Alberti, in his treatise on architecture, *De re aedificatoria*, followed Vitruvius in his definition of the *concinnitas* or beauty of a sensible object: “It is the task and aim of *concinnitas* to compose parts that are quite separate from each other by their nature, according to some precise rule, so that they correspond to one another in appearance” (VII.4),⁴ as the varied parts of the sur-

face of the agent are united at the apex of the cone of perception in the eye, in the sensible form as it is imprinted in the imagination.

In *De lineis*, Grosseteste described rays of light which extend from the apex of a pyramid on either side. Rays which are extended continuously and straight from the apex on one side form angles with rays extended on the other side. Alberti defined the rays on the outside of the pyramid, extended from the apex, as “extrinsic rays,” which are rays of light which define the outline, measure and dimension of surfaces, as described by Grosseteste. The extrinsic rays of Alberti define the outline of the cone of light in vision. As for Grosseteste, a cone is formed between the surface of the agent and the eye of the recipient. In the *De pictura* of Alberti, “The base of the pyramid is the surface seen, and the sides are the visual rays we said are called extrinsic. The vertex of the pyramid resides within the eye, where the angles of the quantities in the various triangles meet together” (I.7),⁵ as the *virtus* converges in the apex for Grosseteste, and the *species* is unified in the process of the intellectual, *nous poietikos*, combining the sensible form or imprint, with the intelligible form, the idea or prior cause of the form. Alberti’s extrinsic rays of light measure quantity, which is “the space across the surface between two different points” (I.6), the dimensions given by the spiritual light; in between the extrinsic rays are what Alberti calls “median rays,” which fill in the space between the extrinsic rays, and which are probably reflected and refracted rays of light.

The median ray is contained within the space of the cone of light, and enclosed by the extrinsic rays which form the cone. Median rays, which are weaker than extrinsic rays, as reflected or refracted, or the accidental rays of light of Grosseteste, are not strong enough to give dimensions, to define outlines and measurements, but instead are variable and differentiated, and absorb light and color to varying degrees. The median rays extend between the apex of the cone and the surface of the agent, and fill in the color and shadow found within the outline of the agent, filling in the substance of vision. Among the median rays, according to Alberti, one in the center of the cone stands out among them as the strongest, which is the “centric ray.” The centric ray forms a direct line from the apex of the cone to the center of the surface of the agent, exactly perpendicular to the surface, as the perpendicular line would contain the most *virtus* for Grosseteste. According to Grosseteste in *De lineis*, “the rays of a longer pyramid are closer to perpendicular rays drawn from the extremities of the diameter of the agent and so are stronger, because a perpendicular entrance is strongest...”⁶ In the *De natura locorum*

of Grosseteste, the maximum *virtus* of the perpendicular ray of light is proven in nature, as the perpendicular ray of light shines on the sphere of the earth, the spherical and concentric *corpora mundi*, only in the region of the tropics, where the ray of light is unreflected and unrefracted. The position of the centric ray of Alberti in the pyramid of light, along with the distance of the ray from the apex, as for Grosseteste, determines the disposition of the outline of the surface of the agent. The location of the centric ray determines the position of the outline.

As influenced by Alberti, Piero della Francesca, in his treatise on perspective in painting, *De prospectiva pingendi*, described the extrinsic rays in the pyramid or cone of vision as lines which emanate from the extremities of the surface of the object or agent and end up in the eye, in intromission, in between which the eye receives and discerns them, as they are subject to the judgment of the *vis aestimativa*. The border of the object is defined by the rays of light from the eye in extramission in proportion and measure. The borders of the object, established through measure and proportion by the extrinsic rays from the eye, determine how things diminish in size in relation to the eye, as distances in space are learned in the process of visual experience. The size of objects, and the distances between objects, correspond to the sharpness of the angle in vision; the more acute the angle, the greater the *virtus*, as for Grosseteste. In *De lineis*, Grosseteste explained that “the apex of a shorter pyramid will be more active, and so will alter a passive object more” (Eastwood, p. 125), because the rays of the shorter pyramid make lesser angles than the rays of the longer pyramid if they are extended from the apex.

In the *De prospectiva pingendi* of Piero della Francesca, perspective is defined as *commensuratio*, and the elements of *commensuratio* are points, lines, and plane surfaces. The point is defined as that which has no parts, something which is beyond the sensible, according to geometers, something which does not contain quantity, or is incorporeal, as in the apex of the cone of vision. The point corresponds to the autodiffusion of *lux* of Grosseteste, from which emanate the rays of light which contain the *species* or *virtus* of the sensible world; the point also corresponds to the eye of the viewer, where the rays of light converge, and the *species* is unified, in the process of perception. The point in the eye is the place at which the sensible form of the object, becomes the intelligible form of the object, as it is imprinted in the imagination by the cosmic intellect. The model of vision described by Grosseteste, and found in the treatises of Leon Battista Alberti and Piero della Francesca, thus consists of two cones or pyramids of light in intromission

and extramission, intersecting, as it were. Light needs to extend from a point in the form of a cone in order to define the dimensions of the sensible world, and light needs to converge at a point in the eye, at the apex of a cone of rays of light, in order for the dimensions of the sensible world to be perceived.

De amore, or the *Commentary on Plato's Symposium*, was written in 1469, after Marsilio Ficino had finished translating the works of Plato for the Medici family. It was not published until 1484, when it was included with Ficino's translations of Plato's works from Greek to Latin. Ficino's definition of beauty follows the Platonic definition as depending on a universal principle, that is, as given by language. According to Ficino, that which pleases the soul must be an incorporeal beauty, a conceptual representation not based in sense perception. In *De amore*, II.9, "beauty of the soul also is a splendor in the harmony of doctrines and customs," in the matrix of language which creates the identity of the subject in terms other than sense perception. Desire in *De amore* is not a physical, instinctual desire, but a desire created by language in the construction of perception. In II.2, "For it is the same God whose beauty all things desire, and in possessing whom all things rest. From there, therefore, our desire is kindled." Desire is governed by knowledge of God, knowledge of the archetypal principle in language. Perception, and judgments of beauty, are governed by the desire which is a function of language. Perception and desire are constructed through language. The desire for the good in the *circuitus spiritualis* through the hypostases is that which governs artistic expression.

The hypostases are described in the first speech in *De amore*, made by Giovanni Calvalcanti, a friend of Ficino's, to explain the speech made by Phaedrus in the *Symposium* of Plato. The hypostases are the angelic mind, the world soul, from Plato, and the world body. God himself is not accessible to the hypostases, as He is infinitely simple, and not of the world, which is necessarily multiple, and ornamental, that is, a product of perception. Both the ornamental machine of the world and the ideas behind the machine are created by the inaccessible God, just as the archetypal forms are created by the children of the demiurge in the *Timaeus*. The inaccessibility and infinite simplicity of the origin are qualities of the One of Plotinus. The world prior to the creation of forms is chaos, formless and dark. Chaos turns to order through the creation of the substance of the mind, the archetypal idea, which is its essence. The essence, which is itself formless and dark, is imbued with a desire to "turn towards God," as it is born from God. The essence of mind,

the archetypal idea, is in Plotinus the Intellectual, that part of mind which understands the intelligibles, and in which the divine idea participates.

In *De amore*, everything which is perceived is painted on the angelic mind, from which are created the forms of all sensible objects, the spheres and the vapors, like the archetypal forms which are created by the children of the demiurge of Plato. The form of each type of sensible object is given a mythological character, to reinforce the fact that the forms are products of the celestial mind, that they determine perception of the sensible world, rather than being determined by it. The form or idea of the heavens, or the sphere of the fixed stars, is Uranus. The forms of the first two planets are Saturn and Jupiter. The form of fire is Vulcan, the form of air is Juno, the form of water is Neptune, and the form of earth is Pluto. Without the ordering of the sensible world by reason in perception, the world would only appear as disconnected chaos. Such perception is a function of the desire created in mind by reason itself for the operation of the human being in the sensible world, which depends on its ordering by reason, but in a process which is inaccessible to reason itself, which escapes the self-consciousness of reason, and is thus a function of the essence or intellectual.

One loves to look at nature because one loves the way that it conforms to their idea of the order of the world, as in mathematics and geometry. One loves the sensible world because it reinforces intellect, and the inaccessible source of the generation of ideas within it. The World Soul, the structure of the cosmos, turns toward the same ideas, from formlessness and chaos, and its turning is caused by love also. The world around the subject desires what the subject desires. The world becomes a world when it has received the forms from the mind, that is, when it is perceived. Without love, without the subject being present to perceive it, the world would just be formless matter, disconnected and haphazard. But love is innate in it, and it turns toward order in perception.

In *De amore* I.4, It is through the intellect and perception that love is satisfied, as opposed to through bodily functions. The harmony in intellect corresponds to the harmony in vision and sound. The visual form of a work of art corresponds to the form of the ideas in the mind, and is thus considered beautiful, and incites desire, for beauty in form and virtue in mind. The work of art is successful if it incites that desire, the desire for God, and never satiates that desire, as desire for the infinite and inaccessible can never be satiated. Thus the viewer would always have the desire to return to the work of art, and see it again, because it conforms to the desire of the intellect for the

good, or the idea of forms which orders the world in perception, and language as well, as a function of perception.

The “beauty of the human body requires a harmony of different parts” in the same way that perception requires a harmony of forms and colors and language requires a harmony of words in a syntax. The harmony of the different parts of the body is itself a syntax. The form of each sensible object in perception which is shaped by the idea in the imprint is seen as a sign, or a signifier, as in language. To the signifier as form corresponds an idea, in the intellectual, as signified, just as an idea corresponds to a word in language. The sign in perception, a head or leg in a body, for example, corresponds to an idea of the head or leg in the intellectual. The harmony of the parts of the body is not given by the body, but by perception and intellect, as a function of desire; without the perceiver, the body is a chaotic, disconnected, arbitrary assemblage of parts, which in the Renaissance would be defined as the ugly.

Love, and desire, are functions of the graces, in intellectual, visual, and aural harmony. The “appetite which follows the other senses is not called love, but lust or madness.” Love between two people is a mutual desire for beauty, a reciprocal understanding of what beauty is, in both body and intellect. In *De amore* II.9, love of the body is only in the visual perception of the body, in the beauty of the “splendor itself in the ornament of colors and lines.” The “desire to touch is not part of love...but rather a kind of lust and perturbation of a man who is servile.” Love in intellect is a mutual desire for those laws and customs which are seen as harmonious and beautiful. “Beauty of the soul also is a splendor in the harmony of doctrines and customs.” Platonic love, the idea of Ficino and not Plato, is the reciprocal desire for beauty in soul, the shared love of God.

When “we are attracted to a certain man as part of the world order,” as Carlo Marsuppini, a student of Ficino, suggests in the fifth speech of the *Commentary on the Symposium*, we find the person beautiful in so far as they conform, either physically or intellectually, to our idea of beauty as it exists in and is defined by the matrix of laws and customs in which we operate, that is, the ornament of the world, the *cosmos*. In V.5, we are attracted to that certain person “especially when the spark of the divine beauty shines brightly in him,” that is, his form corresponds to the light in our imagination. We find a person beautiful when “the appearance and figure of a well-constructed man correspond most closely with that Reason of Mankind which our soul received from the author of all things and still retains.” Beauty is in the eye of the beholder, and beauty is culturally conditioned.

As the beauty of a sensible object depends on its correspondence with the form of the imprint in perception as determined by the idea, “it happens that the external form of a thing, striking with its image the Form of the same thing depicted in the soul, either disagrees or agrees with it...” Whether the sensible object agrees with the form of the imprint or not depends on “a certain natural and hidden incongruity or congruity,” and then “moved by this hidden opposition or attraction, the soul either hates or loves the thing itself.” The hidden quality is that part of mind which is not accessible to discursive reason, *nous pathetikos*, the reason principle of Plotinus. The intellectual is the higher part of mind which is able to understand intelligibles, ideas in forms which are not apparent to logic or conscious reason. Marsuppini paraphrases *Enneads* I.6.2 and V.3.3 of Plotinus.

At the end of his speech Marsuppini asked, if “anyone asked in what way the form of the body can be like the Form and Reason of the Soul and Mind, let him consider...the building of the architect.” The harmony of proportions of the work of art corresponds to the harmony of proportions in music, and the harmony of proportions in mathematics and geometry, instruments of the *explicatum* or unfolding of the intelligibles in intellect into the forms of discursive reason, as elaborated by Nicolas Cusanus. The analogy of the building of the architect, taken from the tenth book of the *Republic* and the sixth tractate of the first book of the *Enneads*, illustrates the correspondence between the architecture of the building and the architectonic, the transcendental idea, of the architect. The architectonic is the ornament or structure of the cosmos, as in the geometrical solids molded by the children of the demiurge in the *Timaeus*. The transcendental idea is the idea which pre-exists perception, the concepts which order the sensible world but do not exist in it, and all the proportional relations derived from them in mathematics and geometry in discursive reason.

The design of the building is the form of the sensible object which corresponds to the idea of the architect. All forms in architecture and art are necessarily ideas pre-existent in the mind of the architect or artist, even if they are arrived at by chance. The architecture of the building exists completely independently of its matter; architecture requires no matter at all, as it is the form of the architectonic. “Therefore go ahead,” Marsuppini says, “subtract its matter if you can (and you can subtract it mentally), but leave the design. Nothing of body, nothing of matter will remain to you.” The form of the art or architecture is identical to the idea in the mind, in the process of the imagination which is the *Vorstellung*, picture thinking, which is ordered in lan-

guage, as well as mathematics and geometry. In the *Vorstellung*, pictures are transformed into words as they become mnemonic residues. The mnemonic residue of the imprint becomes the word in language as the spirit of the divine becomes the logos, and the order of the syntax of the language, of words or forms, corresponds to the order of the idea.

Tommaso Benci summed up the theses of the *Commentary*. In VI.8, the form of a body, the shape of a sensible object, is received by the eye, and by penetrating the spirit, corresponds to the figure of the idea of the body which is contained in divine intellect. The correspondence “pleases the soul,” producing the grace of love which is beauty, because it “corresponds to those Reasons which both our intellect and our power of procreation preserve as copies of the thing itself,” the power of procreation being the imagination, the reasons being the linguistic equivalent of the figure in the picture thinking, the basis of memory. In perception, an imprint of a figure is received by the eye, and it is matched to a figure in the imagination, and transferred to reason in language, and through the intervention of divine intellect, the figure is understood in relation to the architectonic of the cosmos, which results in beauty and love.

In VI.13, all things are understood by the light of the divine intellect, “but the pure light itself and its source we cannot see in this life,” as it is that part of soul or intellect which is inaccessible. Intellect “can turn to this light whenever it wishes,” through “purity of life and intense concentration of desire,” and in so doing “it shines with the sparks of the Ideas.” Accessing the essence of mind, divine intellect, in reason requires effort, and each individual is free to either make the effort, or to live a life among shadows, being manipulated in thought by sensual forms and sensual desires.

Cristoforo Marsuppini, another student of Ficino, further summarized the *Commentary* in the seventh speech. In VII.1, memory in intellect is described as a mirror which reflects an image of the figure of a sensible object like a ray of light through the eyes, so that another image is formed, as if a piece of wool next to the mirror might be set on fire by the light reflected by the mirror, and the blazing wool would be an image of the sun. The image of the blazing wool in the imagination is a splendor of the first image, “by which the force of desire is kindled and loves,” as perception is a function of desire.

In the summation of Marsuppini, “love, kindled in the appetite of sense, is created by the form of the body seen through the eyes,” as perception is a function of desire, but in perception or imagination the form of the body is without matter. The lack of the matter of the form of the body in vision cre-

ates desire, the desire caused by lack, in the disjunction between form and matter. When the figure of the form of the body in the imagination is transformed to or made to correspond to the figure of the form of the archetype in intellect, it is transformed from a particular form to a universal idea in a process of abstraction. Thus “there immediately appears in the intellect another species of this image, which no longer seems to be a likeness of one particular human body, as it was in the fancy, but a common Reason or definition of the whole human race equally.” The particular form becomes an instrument in reason by which a universal abstraction is made, as in the *Symposium*, by which an idea is formed which orders experience.

As Plato divided beauty into the terrestrial and celestial, *venere vulgare* and *venere celeste*, as illustrated in the *Birth of Venus* of Alessandro Botticelli, so love is divided by Marsuppini into bodily love and intellectual love. A “love inclined toward the senses” resides in “the appetite of sense devoted to the body,” while “another love which is very foreign to commerce with the body” resides in or arises from “intellect’s universal species or Reason.” As sensible objects can only be given as representations in intellect, so the love which resides in the senses can only be given by the love which resides in intellect, and can only be seen as false, without essence, as are objects outside of perception.

The premise of perspective construction is that the real world is not immediately perceived, that it is given to us through the intermediary of geometry and mathematics, that vision is a conceptual process. Perspective in painting reproduces the world as geometrically constructed. A scene constructed with perspective appears more real or natural to us precisely because it is not real or natural, because our perception of the world around us does not correspond to the world as it actually exists. This is the thesis of Immanuel Kant, and it is also a basis for the theory of perception of Plotinus. The *Enneads* of Plotinus were translated into Latin by Marsilio Ficino in the Renaissance. Although there is no reference to Plotinus’ theory of perception in the major treatises on perspectival construction written during the Renaissance—that is, the *De pictura* of Leon Battista Alberti or the *De prospectiva pingendi*, *On Perspective in Painting*, of Piero della Francesca—Plotinus’ development of Plato’s theory of vision is present in the theoretical basis of Renaissance perspective. References to Plato by Alberti and Piero form the basis of the Neoplatonic element of Renaissance artistic theory. But Ficino did not begin the translation of Plotinus until 1484, fifty years after Alberti’s treatise and ten years after Piero’s treatise.

Perspective construction, or *costruzione legittima*, was seen as both a model of vision and a geometrical allegory of Neoplatonic emanation, in Leon Battista Alberti's *De pictura* and Piero della Francesca's *De prospectiva pingendi*. In the *De prospectiva pingendi*, perspective construction is a form of *commensuratio* in painting, or proportion, based on the progression from point to line to surface to body. Such a progression serves as a model for the unfolding or *explicatum* of the material world, as can be found in the *Timaeus*, Euclid's *Elements of Geometry*, and Proclus' *Commentary on the First Book of Euclid's Elements*, all available from medieval translations. The geometric progression corresponds to Piero's pyramid of vision, following the theory of perception of Alberti in *De pictura*, and corresponding to Ficino's model in the *Theologia Platonica* of 1482.

Of the three parts of painting, Piero declared at the beginning of *De prospectiva pingendi*, only *commensuratio* would be discussed, or perspective, but "mixing in parts of *disegno*, without which it is impossible to demonstrate perspective."⁷ Color would be left out, but the parts of painting would be discussed "that can be demonstrated with angled lines and proportions, that is, the points, lines, surfaces and bodies."⁸ These classifications correspond to the definitions of Euclid's *Elements of Geometry*. Piero identified five elements that need to be considered in the perspective construction of a painting: sight, or the eye; the form of the thing seen; the distance from the eye to the thing seen; the lines that connect the eye to the extremities or bordering lines of the thing seen; and the area between the eye and the thing seen.⁹ These five elements need to be understood in order to understand perspectival construction.

The eye is defined as that in which are represented all of the things seen under different angles. Objects appear as images in the eye depending on the angle of projection of the lines from the extremities of the objects to the eye; the larger the angle, the closer and larger the object. Objects in space occupy a hierarchy of being, or value, given by the variation in the relation to the angle of projection. This is stated in the Eighth Theorem of Euclid's *Optica*.¹⁰

Sensible things, or objects in the sensible world, are therefore abstracted and transformed into images in the eye through geometry. The images in the eye exist as copies of the sensible objects, and the objects become intelligible in the mind's eye, or objects of the intellect. This is a core idea in the *Enneads* of Plotinus. In the *Enneads* V.5.7, "actual seeing is double; take the eye as an example, for it has one object of sight which is the form of the object perceived by the sense, and one which is the medium through which the form

of its object is perceived, which is also itself perceptible to the eye; it is different from the form, but is the cause of the form's being seen....” The forms and proportions of sensible things are constructed in the mind, from the idea of the things, or the intelligibles, which are translated to the sensible world through mathematics and geometry, by way of perspective construction as it plays a role in vision. It is the form of the thing, according to Piero della Francesca, rather than the thing itself, without which the intellect cannot judge nor can the eye comprehend the thing. For Plotinus, in III.6.1, “sense perceptions are not affections but activities and judgments concerned with affections....” Things in the real world cannot be received immediately through sense perception as themselves, because sense perception itself is a cognitive process. In the twentieth century, David Layzer wrote, in *Cosmogony: the growth of order in the universe*, “Human visual perception is a cyclical process in which the brain constructs, tests, and modifies perceptual hypotheses. In order to have a percept, we must construct it.”¹¹

In the *Enneads* IV.7.6, Plotinus distinguished between perception and what might be called apperception, or multiple perceptions. Actual perceptual experience is multiple and diversified; perceived objects have no necessary connections in size or position, and can be perceived in a variety of ways by the different senses. But in human perception all objects and acts of perception are unified to form a coherent whole which structures the world around us. When the fragmented and variable objects of perception “reach the ruling principle they will become like partless thoughts...”; they are organized in a conceptual process. Perception entails the intersection of the immediately perceived image, the *percipi* or *imago* in psychoanalytic terms, with a conceptual process, which involves what might be called *a priori* concepts, in Kantian terms, and concepts which are activated by sensory activity. The possibility of the *a priori* concept in Plotinus' model of perception is suggested by Mike Wagner in his dissertation, *Concepts and Causes: The Structure of Plotinus' Universe*. According to Kant, in the *Critique of Pure Reason*, space and time are conceptual structures which do not exist in the real world, or are not given by the senses. The nature and existence of the world around us outside of our ordering of it in the structures of space and time is unknowable to us. We can only know the world as our own geometrically constructed version of it, as our representation of it to ourselves. Perspective construction, as defined by Alberti and Piero, constitutes the world as we can know it as a representation of it to ourselves in abstract and minimal, universal terms.

Plotinus described perception as a dialectic of the universal and particular, to put it in Hegelian terms. The perceived object is both whole and divided into parts. In the process of perception “there will come to be an infinity of perceptions for each observer regarding the sense object, like an infinite number of images of the same thing in our ruling principle” (IV.7.6). It is the conceptual process which structures the infinite subdivision of perception, as in the *explicatum* of Nicolas Cusanus; the unity of perceptual experience is inaccessible, as is the vanishing point of perspective in relation to the lines of emanation, or the unity of the One in the point. Plotinus suggests what Jacques Lacan confirms in the twentieth century; we are inherently fragmented beings in our representation of the world to ourselves in perception as a function of our conceptual processes. We are caught in a perpetual cycle of desire to overcome our own fragmentation, which manifests itself in the concept of the metaphysic. Perspective construction represents the dialectic of the inescapable fragmented and multiple nature of perception and the metaphysical unity towards which desire leads us; perspective construction is thus a graph of desire, for our own unattainable unity, and for the real existence of the world around us beyond our representation of it to ourselves.

For Plotinus, perception is a function of this desire, and a mechanism of the conceptual process, and memory in particular. He asks, “does our remembrance of the things we desired accompany our power of desiring...?” (IV.3.28). The conceptual process is composed of the perceived object, desire, and memory. “On this assumption the desiring power is moved by what it enjoyed when it sees the desired object again, obviously by means of the memory. For why should it not be moved when something else is seen, or seen in a different way?” Thought in Plotinus, as a kind of Hegelian picture-thinking, is composed of mnemonic residues of perceived objects, what Plotinus calls “imprints” in “recollections.” In V.3.2, “as for the things which came to it [that is, soul] from Intellect, it observes what one might call their imprints...and it continues to acquire understanding as if by recognizing the new and recently arrived impressions and fitting them to those which have long been within it: this process is what we should call the ‘recollections’ of the soul.” Our thoughts are propelled by the desire created by the multiple and fragmented images of perception, by the desire to reconnect the mnemonic residues of images given by the senses in our minds to the world around us. As Plotinus describes it, “the reasoning power in soul makes its judgment, derived from the mental images present to it which come from sense-perception, but combining and dividing them....”

The desire is always thwarted because of the barrier put up by our *a priori* conceptual structuring of the world, so the desire is perpetual and never satiated. The mnemonic residue would be defined by Sigmund Freud as the *Vorstellungsrepräsentanz*, the representation of the representation, as derived from Hegel; and the mnemonic residue is at the core of the Plotinian concept of the intellectual, or *nous*, that which is other than discursive reason in mind. Renaissance perspective construction is generally seen by twentieth-century scholars as being a limited and prohibitive form of representation in art because it does not allow for the uninhibited role of the *imago* or the mnemonic residue, as in dreams, to exist outside of discursive reason. Perspective construction posits discursive reason as an absolute regulator of perceptual experience, because the metaphysical is only accessible through logic. This is the legacy of the Renaissance.

Plotinus did not deny that what we perceive in the world around us is actually there, as George Berkeley might, but he suggests that things appear to us as they are modified by our perception; ultimately we see the form of the thing, but not the thing itself. A perceived object is only known to us as a mental perception, and a mental perception is only known to us as a memory; the production of the mental perception in memory constitutes cognition as an “image-making power,” as in Hegelian picture-thinking. In *Enneads* IV.3.29, “nothing will prevent a perception from being a mental image for that which is going to remember it, and the memory and the retention of the object from belonging to the image-making power....” Through this process, perception as a form of cognition arrives at a conclusion, as the perception of the form of the image is absorbed into a cognitive process, and the fragmented and multiple apperception is transformed into perception, which involves the superimposition of a conceptual structure onto the perceived world, as in perspective construction. “If then the image of what is absent is already present in this, it is already remembering, even if the presence is only for a short time.” The mnemonic image replaces the perceived image which replaces the thing, exactly as in Freud’s *Vorstellungsrepräsentanz*.

Given that we can only know the world around us as images reproduced in cognition, we can only know the world around us as an absence. Such an absence is represented in perspective, which precludes any other possibility of knowing the world around us outside of our cognition of it. The absence is present in the vanishing point, as a negative or apophatic theology; in Platonic terms, the essence of the world is unknowable. In Lacanian terms, the absence is the real, that which is inaccessible to either the symbolic, the

structures of language and perception, or the imaginary, the immediately perceived *imago*, which can only be known as it is absorbed into cognition. The real is that around which desire circulates; we are defined by a continual dialectic of presence and absence, of our representations of the world to ourselves and the unattainable source of those representations.

The vanishing point of perspective construction in the Renaissance corresponds in architecture to the altar at the end of the nave of the church, to the location of the transubstantiation in the Eucharist, to the point at which the material world, or our representation of it to ourselves, becomes immaterial, and inaccessible. The system of perspective, as developed by Filippo Brunelleschi for the design of the basilica church, entailed this symbolic aspect. In a painting such as Leonardo da Vinci's *Last Supper* in the refectory of the Church of Santa Maria della Grazie in Milan, the vanishing point of the perspective corresponds to a void through a painted window in the center which corresponds to the location of the figure of Christ as the material manifestation of the immaterial. The receding lines which construct the illusionistic space from the vanishing point also continue beyond the picture plane to construct the space of the refectory itself. We not only perceive this illusionistic space, but we inhabit it, and we are drawn through it to the point at which it fails to exist outside our own perception and cognition. In Baroque representation, the regular geometry of the emanation of the illusionistic world is replaced by irregular tumult and chaos in relation to the ineffable vanishing point, as in the *Assumption of the Virgin* in the Cathedral of Parma by Antonio Correggio, for example. In the Baroque it is no longer possible to approach the point at which reason fails through reason itself, because reason itself, or reason in perception, is seen as fragmented and multiple and inadequate, corresponding to the model of Plotinus.

According to Plotinus, in IV.3.30, "The intellectual act is without parts and has not, so to speak, come out into the open, but remains unobserved within, but the verbal expression unfolds its content and brings it out of the intellectual act into the image-making power, and so shows the intellectual act as if in a mirror, and this is how there is apprehension and persistence and memory of it." Beyond language and perception the intellectual act is inaccessible to us, except as a reflection in hindsight. Beyond the scaffolding of our thoughts and perceptions, we are inaccessible to ourselves, as in psychoanalysis the unconscious is inaccessible to conscious thought except through the fragments of dream images, according to Freud, or the fragments of linguistic functions, according to Lacan. For Lacan, meaning in language only

exists as a reflection in hindsight after the speech-act has taken place. What lies behind our own thoughts is only accessible to us as fragmented and diversified mnemonic images in picture-thinking, which constitute a reality as ordered by the vanishing lines in perspective. The vanishing point is that point at which we can see behind the mirror, as we are caught between the reflections of the sensible and intelligible, and we can see that there is nothing there, nothing beyond our constructed perception of the world.

A diagram of intersecting pyramids of light appeared in the *De coniecturis (On Conjecture)* of Nicolas Cusanus, written between 1440 and 1445 as a sequel to his major theoretical work, *De Docta Ignorantia (On Learned Ignorance)*. Cusanus described the intersecting pyramids as a *figura paradigmatica*, a paradoxical figures of light and dark, representing the progression from unity to alterity and alterity to unity, as, from Plato, all things are composed of the combination of contradictories, in the *coincidentia oppositorum* or coincidence of opposites. The base of the pyramid of Cusanus is the darkness of primordial origin, the inaccessible which precedes the sensible world, while the apex is infinite unity, the *lux spiritualis*. In between the base and the apex, bordered by the extrinsic rays of light, is found all sensible matter. As the pyramids intersect, unity is everywhere contained in alterity and alterity is everywhere contained in unity, as all sensible matter is made possible by the spiritual light.

In the seventeenth century, intersecting pyramids of light and dark appeared in the *Microcosmi Historia (Microcosmic History)* of Robert Fludd, published in Oppenheim by Johannes Theodore de Bry in 1619, as part of the series *Utriusque Cosmi Historia*. Corresponding to the celestial hierarchies, Fludd conceived the universe as composed of three pyramids: body, soul and spirit, divided into three parts each, terrestrial, celestial and supercelestial. The pyramids of light proceed from the apex of the spirit, the *lux spiritualis*, to the base of matter, alterity and complexity. The procession is created by light from the sun, the *lumen solaris*, which divides the world in substantial parts. In the diagram of intersecting pyramids of Fludd, the base of the pyramid of light is the Trinity, represented as the sun, and the base of the pyramid of darkness is primordial unformed matter, represented as the earth. Intersecting pyramids of light and dark also appear in the *Prodromus Coptus Sive Aegyptiacus* (1636), *Obeliscus Pamphilius* (1650), and *Musurgia universalis* (1650) of Athanasius Kircher in seventeenth-century Rome.

By 1634, Kircher had already published, in *Primitiae Gnomonicae Catopticae*, a study of light and optics. The study was elaborated in *Ars magna*

lucis et umbrae and *Musurgia universalis*. In *Primitiae Gnomonicae Catopticae*, Kircher described intersecting pyramids as representing the diffusion of light from the apex or archetypal form, the prior cause, into the sensible world, which is transmitted in the intellectual, *nous poietikos*, and reflected as in a mirror in the soul to form the sensible form of the archetypal principle or intelligible, the intelligible form. In the intersecting pyramids described in the *Primitiae Gnomonicae Catopticae*, the rational forming principles of matter are transmitted as ideas by light from the sun into the material world. The sensible form is created at the point of intersection of the two pyramids, representing the intromission and extramission of light in perception. The intersection is also the point at which a perpendicular line from the sun, the median ray of Alberti, would touch the reflective plane of the pyramids, the surface of the agent.

Intersecting pyramids serve to illustrate a proto-scientific theory of vision and light in the *Primitiae Gnomonicae Catopticae* of Kircher. One pyramid is formed with the apex at a point on the surface of visible things and the base in the sphere of the eye (what René Descartes would call the crystalline humor,¹² or lens), while the other pyramid is formed with the apex at the center of the back of the sphere of the eye (what Descartes would call the optic nerve, or retina) and the base on the surface of visible things, forming a mirror image. The pyramid with the apex in visible things corresponds to a polished body, reflecting the sensible form, while the pyramid with the apex in the eye corresponds to a luminous body, emanating light in extramission, from the reflected spiritual light, *lumen spiritualis*. A perpendicular line connects the center points and the point of intersection of the pyramids.

Form is made visible as the *species sensibilis* as it moves along the straight line through a point at the center of the surface of visible things, and then spreads out in lines to form a continuous body or sphere, as for Grosse-teste, as it is perceived by the eye. As Kircher explains, “As the form of the point of the surface of visible things moves towards appearance according to one perpendicular line, it meets the surface in one point, directly visible to the eye. The line extends to all points of a sphere, all concurring in a center, so that all the lines make a continuous body, and the continuous surface is made visible at each point, which is the central boundary of the eye.”¹³ The formation of sensible objects in the dimensions of light in space corresponds to the formation of the *species sensibilis* in the mechanisms of the eye in vision. “In this manner every line extends from the apex of a pyramid as the center of the eye,” in the extramission of light, “with the base being the sur-

face of visible things,” the surface of the agent. “Form as the points [of light] on the surface of visible things extends along straight lines, through each point, and the apex of the pyramid, which is the center of the image, in the liquid surface of the undercoat of the eye, divided by the pyramid,” in the intromission of light. “A polished body opposes a luminous body, creating a point of light,” in the intersection of the intromission and extramission, sensible and intelligible, in the *coincidentia oppositorum*. “Over the surface of the polished body a pyramid is formed with the apex in the mirror reflection of the image,” in the soul or *anima rationalis*, “and the base in the surface of the luminous body, proceeding through the pyramid to the opposite point, whose point is itself a luminous body, the true base in the surface of the polished body, said to be vision.”

Lines extended from a point of vision to the continuous body of a sphere form the shape of a pyramid, and it is along these lines which light moves to make form visible, to actuate the *species sensibilis*. “Through every line light moves to the image. The linear reflection of the inner position is the result of the linear movement of light.”¹⁴ Light is conceived of in terms of straight lines, the lines emanating from an apex to form a pyramid. In an analogue of the process of creation, the *species* is made visible through the intersection of the pyramids in the field of vision in the formation of the spheres of the visible and its mirror image in the eye.

In Kircher’s scheme, human intellection is based on the process of the construction of vision in perception, as it is for Grosseteste, as light is reflected through an idea in vision. The sun, as the source of rational forming principles or intelligibles, in the *irradiatio spiritualis*, is described as a luminous body; thus “light descends from the luminous body to form a reflected body, perceived as a point on a surface, at which point the two pyramids intersect.”¹⁵ The spiritual light is reflected to form the image of matter, the *species sensibilis*, which is seen to be an imperfect simulacrum of the intelligible, the *species apprehensibilis*, as represented on the frontispiece of Kircher’s *Ars magna lucis et umbrae*. The image provided by the spiritual light, reflected as in a mirror, reverberates through a denser medium, refracted and deviated, in the soul. Without the illumination of the *intelligentia* or cosmic intellect of Grosseteste, in the development of the *virtus intellective* or intellectual, the sensible form can only be seen as a distorted and corrupted version of the intelligible form, as it is subject to the corporeal functions of the soul, and can only be the Platonic shadow of reality.

The same model of the formation of the *species sensibilis* was described by Marsilio Ficino in the *Theologia Platonica* in 1469: “the soul accomplishes in the body an admirable task as the divine ray, filled with ideas, descends at once to the soul, compelled by the vital force of the soul and by its quality in the matter of the universe,” but “in which it forms certain distant and blurred representations of ideas as light forms images of colors in a mirror, or a drawing on the ground forms shadows of divinities.”¹⁶ Kircher explains in the *Ars magna lucis et umbrae* that in the soul, the archetypes or intelligibles are manifest in copies in the *species sensibilis*, while being intelligible in the intellect, in the *species apprehensibilis*. Unity and singularity in the intelligible in the *virtus intellectiva*, as illuminated by the *lux spiritualis*, become multiple and diffused through the functions of the *anima rationalis*.¹⁷ In the seventeenth century, the divine intellect can only be known through similitudes in shadow, as the similitudes are “reflections of divine forces in the mirror of the angelic intellect.”¹⁸

Light is described by Kircher in the *Primitiae Gnomonicae Catopticae* as “radiating in a fertile manner, stimulating motion and desire,”¹⁹ as in the *De amore* of Ficino, “turned toward God,” the *virtus intellectiva* “is illuminated by His ray,” and the desire of the *virtus intellectiva* is increased by the splendor of the ray. For Kircher light is diffused in a celestial sphere, as in Grosseteste, in which divine intelligence, *intelligentia*, is manifest in images and forms, *species sensibilis*, through geometrical abstraction and intellectual organization in the *virtus intellectiva*. According to Kircher, “Light is a symbol of the goodness and truth of God,” a symbol of the good, “passed through desire through angelic and human intelligence, according to Pseudo-Dionysius. In the heavens, according to Hermes Trismegistus, life is a copy of the divine mind made by the angels,” or the children of the demiurge of Plato, “as the unfolding of virtue, as Plato also says. A certain energy is implanted in fire from above, and everything accessible to the senses is diffused by grace and divine goodness, in copies and images.”²⁰

The source of the transmission of the light is incomprehensible to the *virtus intellectiva*, in the mechanisms of the *virtus cogitativa*, and can only be intuited through sensation and apprehension for Kircher. According to Kircher, “light diffused in all natural things is as an incomprehensible good (as Marsilio Ficino says), undefined by philosophers, a clear light from an unknown source,”²¹ the *lux spiritualis*. As Pseudo-Dionysius explained in the *Mystical Theology and Epistles*, “the creation of the visible universe is a veil placed before the invisible things of God....visible things are in truth clear

images of the invisible,”²² though corrupted simulacra, created by the mechanisms of vision. As God is incomprehensible, and the source of all light and life, according to Pseudo-Dionysius, He is “the highest peak of mystic inspiration, eminently unknown yet exceedingly luminous,” as the source of light, “where the pure, absolute and unchanging mysteries of theology are veiled in the dazzling obscurity of the secret silence, outshining all brilliance with the intensity of their darkness, and surcharging our blinded intellects with the utterly impalpable and invisible splendor surpassing all beauty,”²³ in the *via negativa* of negative theology.

In the *Obeliscus Pamphilius* of 1650, Kircher described the form of the pyramid as four inclined surfaces sloping from an apex to a base, extending into the material world and forming all things in nature from a single principle and source. God the highest artisan is diffused into various species. The pyramid represents the primordial origin of the world, from Egyptian theology, as life flows from a motionless sun into a previously formless universe, as described by Kircher.²⁴ The four corners of the base of the pyramid are the four platonic elements which constitute the underlying structure of the material world, Fire, Air, Water and Earth. The obelisk was also described in the *Obeliscus Pamphilius* as being composed of the triangular apex of the divine, the shaft of angelic transmission in descent and ascension between the celestial and terrestrial, and the quadripartite base of the material world. The four sides of the three regions form the twelve locations of the zodiac, comprising all of existence. The obelisk is called the finger of the sun; the rays of the sun depart from the apex, as can be seen on a stela in the Egyptian Museum in Cairo. The four elements of the base are formed from primordial chaos in the sublunary world.²⁵

The world as it is perceived is a product of the world as it is understood in the *virtus intellectiva*, as a product of the engagement of the intelligentia., in mathematics and geometry. As Francesco Giorgi expressed in *De Harmonia Mundi* in 1525, “According to the writings of Pythagoras it was believed that in these numbers and proportions the fabric of the soul and the whole world was arranged and perfected.”²⁶ In the *Divina proportione* of 1509, Luca Pacioli explained that while music considers harmonic proportion, the visual image considers arithmetic and geometry, as sight is the first door to the intellect.²⁷

In his *Arithmologia, sive De abditis Numerorum mysteriis (Arithmology, or the Concealed Mystery of Numbers)*, published in Rome in 1665, Athanasius Kircher developed the idea of Nicolas Cusanus that the universe and

creation are contained in a series of numbers, extending in gradations from the simplest unit, or God or Monad. All numbers flow forth in multitude from the Monad, the supercelestial realm of unity and abyss. As numbers emanate from unity, they are composed by the intellect.

Numbers for Kircher “begin from unity or the superterrestrial Monad and are joined together as they are conceived or perceived in the intellect, or examined by sight in vision, composed according to order, type and species.”²⁸ They are thus a manifestation of the fruitfulness of the eternal or cosmic mind. The monad is the beginning principle which incites motion and alterity in the material world. “From this the Four Elements are formed, and the alternation of time, the motion of the stars, and the revolution of the heavens.”²⁹ The unity and simplicity of the monad are from a celestial source which causes all multiplicity and fertility and which surpasses human intellect.

Kircher explained that the discernment of numbers by the intellect emanating from the divine mind provides the means by which the divine mind can be incorporated into the human mind (the *similitudines intelligibilium impressas ab eisdem intellectui nostro* of the Accademia di San Luca), in that numbers are an abstraction of material reality. “God in creation becomes our mind in the production of numbers. The Divine Mind divides everything, as our mind discerns everything. God divides and produces things in real substance, while ours divides and produces only numbers, which are similitudes of Divine divisions.”³⁰ Following Cusanus, the unity of the monad becomes multiple by first repeating itself or doubling. Doubling, the beginning of all creation, contains the necessary opposite forces of creation. The necessary opposite forces of creation are added to the unity to produce the trinity, the most basic composition of the substance of creation. In the geometrical abstraction of the intellect “the trinity is the first principle of all rectilinear figures, developed from the binary and the unity, as symbolized by the sign of the pyramid,”³¹ according to Kircher.

The triangle is the primary geometrical unity, symbolizing the connections between the Father, Son, and Holy Spirit, and it is “the first unity which is the source and origin of all surfaces and rectilinear figures.”³² As Kircher describes in *Arithmologia*, the triangle symbolizes connections between: Divine, Angelic and Human; Rational, Sensible and Vegetative; Mind, Intellect and Reason; Concept, Word, Symbol; and Point, Line, Surface.³³ The triangle participates in the dyad of opposites in that maximum and minimum coincide in the pyramid as they do in the center and circumference of the circle,

a reference to the thought of Cusanus, for whom the structure of being is analogous to a circle whose center and circumference are both everywhere and nowhere, combining the finite and the infinite. The center corresponds to the infinite abyss of the divine, and is carried by radii to every point of the circumference. In the *De Docta Ignorantia* of Cusanus, “Since the world cannot be enclosed within a material circumference and center, it is unintelligible without God as its center and circumference.”³⁴

Following the thought of Plato, Kircher described the process of creation in geometric terms as the progression from point to line to surface to solid—the geometrical progression by which architecture is created. From the point of the monad, “a line is extended which divides the interval of the dyad, creating the surface of the trinity.”³⁵ From the surface of the trinity, a complete body is created, extended, divided, and measured in intervals. All of the Platonic solids are composed of equilateral triangles, the simplest being the cube, corresponding to earth. “The quadruple or cube is the first solid body formed from numbers. The body is generated in quadruple order, in substance, quantity, quality and location.”³⁶ Each of the four orders of the body, generated by the underlying abstracted principles of creation in numbers, correspond to elements of the motion and multiplicity incited by the monad. “Substance corresponds to generation and corruption, quantity to augmentation and diminution, quality to motion and alterity, location to harmony and correspondence.”³⁷

“The quadruple order is perceptible to the senses”³⁸ in the form of the Pythagorean tetractys, the geometrical representation of the process of creation as a series of progressions from unity to the dyad to the trinity to the quadrant, the sum of which is ten. The tetractys of Pythagoras, which is pictured in the *School of Athens* by Raffaello Sanzio, “contains and holds together all things, which flow forth in musical harmony,”³⁹ according to Kircher. The tetractys is perceptible in all things in that all the elements of the material world can be divided into four parts, for example the four elements, the four cardinal points of the compass, and the four points of the Greek cross. The progression from the point to the cube entails a progression from the divine mind to the angelic intellect, to the soul or spirit and to the body (the intellect is divided into both divine and human parts, following Ficino). “In the unity of the monad is contained the simple and absolute Divine Mind or Essence which produces everything. The dyad contains the unity of the angelic intellect, the trinity contains the soul or spirit, the cube contains

the body.”⁴⁰ In this way the reason of the divine mind is perceptible in the body.

This corresponds to Kircher’s description in the *Arithmologia* of the geometric analogue of creation: “The pyramid is drawn from the beginning point or Monad, and is extended to the base on two sides, constructing the triangle, as the image and archetype of the Platonic triune world.”⁴¹ The inequality of the trinity then incites motion and multiplicity in a cycle of motion from unity to multiplicity back to unity, corresponding to Ficino’s *circuitus spiritualis*, a current of supernatural energy flowing through the structure of the universe, enlivening and animating it.

The hypostases of being consist of the terrestrial world of corporeal forms, dense, intertwined and in shadow; then the rationalization of the corporeal forms in the angelic mind; and finally the resolution of the forms in their absolute archetypal unity. The hypostases of being are modelled in the Universal Figure of Nicolas Cusanus, with the three figures of body, soul and mind inscribed in each of the three levels of the hierarchy, containing the nine choruses of Pseudo-Dionysius in the celestial hierarchies, representing the structure of the universe, as illustrated in a diagram, “Quator dictarum Monadum Schematica explicatio,” in Kircher’s *Musurgia universalis*. The same hierarchy of forms, intertwined on the terrestrial level, rationalized and ordered on the celestial level, and resolved and simplified on the divine level, can be seen on the frontispiece of Kircher’s *Arithmologia*. The cosmic diagram is based in underlying numerical progressions and proportions in the tradition of Renaissance Humanism.

This essay was developed from sections of three chapters: “Philosophy of Vision” in *Robert Grosseteste: Philosophy of Intellect and Vision*, Sankt Augustin: Academia Verlag, 2010 “Perception as a function of desire in the Renaissance” in *Renaissance Theories of Vision*, London: Routledge, 2010; and “Light, Vision and Numerology” in *The Relation Between Architectural Forms and Philosophical Structures in the Work of Francesco Borromini in Seventeenth-Century Rome*, Lewiston, NY: Edwin Mellen, 2002. Additional discussion of Plotinus was added.

¹ Marsilio Ficino, *Commentary on Plato’s Symposium on Love*, trans. Sears Jayne (Dallas: Spring Publications, 1985).

² Plotinus, *Enneads*, trans. A. H. Armstrong (Cambridge, MA: Harvard University Press, 1966).

³ Plato, *Timaeus and Critias*, trans. Desmond Lee (New York: Penguin Books, 1965).

⁴ Leon Battista Alberti, *On the Art of Building in Ten Books*, trans. Joseph Rykwert, Neil Leach and Robert Tavernor (Cambridge, MA: MIT Press, 1988).

⁵ Leon Battista Alberti, *On Painting and On Sculpture*, trans. Cecil Grayson (London: Phaidon, 1972).

⁶ Robert Grosseteste, “On Lines, Angles, and Figures, or the Refraction and Reflection of Rays,” trans. Bruce Stansfield Eastwood, in *The Geometrical Optics of Robert Grosseteste* (University of Wisconsin, Ph.D. Thesis, 1964), p. 129.

⁷ Piero della Francesca, *De prospectiva pingendi* (Firenze: Sansoni Editore, 1942), pp. 63–64: “mescolandoci qualche parte de disegno, perciò che senza non se po dimostrare in opera essa prospectiva...”

⁸ *Ibid.*, p. 64: “che con line angoli et proportioni se po dimostrare, dicendo de puncti, linee, superficie et de corpi.”

⁹ *Ibid.*: “La qual parte contiene in sè cinque parti: La prima è il vedere, cioè l’occhio; seconda è la forma de la cosa veduta; la terza è la distantia da l’occhio a la cosa veduta; la quarta è le linee che se partano da l’estremità de la cosa e vanno a l’occhio; la quinta è il termine che è intra l’occhio e la cosa veduta dove si intende ponere le cose.”

¹⁰ Erwin Panofsky, *Perspective as Symbolic Form* (New York: Zone Books, 1991), p. 35.

¹¹ David Layzer, *Cosmogenesis: the growth of order in the universe* (New York: Oxford University Press, 1990), pp. 261–262.

¹² René Descartes, *Treatise of Man*, trans. Thomas Steele Hall (Cambridge, MA: Harvard University Press, 1972), p. 60.

¹³ Athanasius Kircher, *Primitiae Gnomonicae Catopticae* (Avenione: Ioannis Piot Ex Typographia, 1633), pp. 31–32: “Sicuti forma cuius libet puncti superficiei rei visibilis mota ad visum secundum lineam unam perpendicularem, ab eo ad visus superficiem productam occurrit visus superficiei in uno puncto, in quo non occurrit ei aliud punctum formarum visibilium ad oculum directarum, eo quod a quolibet puncto superficiei rei visibilis ad centrum oculi productis lineis, omnes istae lineae productae in diversis oculi punctis superficiem Sphaericam oculi fecent, et omnes in centrum concurrant, atque adeo omnes istae lineae contineantur in uno quasi continuo corpo-

re, et a punctis quasi continuis unius superficiei res visae ad unum punctum, qui est centrum oculi terminentur, et quemadmodum omnes istae lineae imaginariae sunt in quadam pyramide verticem habente in centro oculi, et basin in superficiei rei visibilis; forma cuiuscumque puncti superficiei rei visibilis extensa secundum rectitudinem lineae, quae est inter illud punctum, et verticem pyramidis, qui est centrum visus, et omnibus tunicarum oculi et humorum superficiebus secantibus hanc pyramidem. Eadem ratione, si corpus politum corpori luminoso opponatur, cadet in quodlibet punctu eius lux a quolibet luminosi puncto. Unde et super corporis politi superficiem fundabitur pyramis cuius apex in ipso speculo, basis vero in superficiei corporis luminosi, et e converso a quolibet puncto luminosi procedet pyramis, cuius acumen in ipso luminoso corpore, basis vero in ipsa politi corporis superficiei non fecus ac de visione dictum est.”

¹⁴ Ibid., p. 32: “Et per quascunque lineas lux ad speculum movetur; lineae reflexionis eundem semper penitus situm habebunt quem lineae motus lucis.”

¹⁵ Ibid., p. 33: “Et cum descendit lux a corpore luminoso per foramen aliquod ad corpus politum; si in superficiei foraminis ex parte luminosi intelligatur punctum, a quo puncto intelligantur duae pyramides basis unius in luminoso, alterius in polito....”

¹⁶ Marsile Ficin, *Théologie Platonicienne, De l’Immortalité des Ames* (Paris: Les Belles Lettres, 1964), p. 117: “L’âme accomplit encore dans le corps quelque chose de plus admirable en ce que ce rayon divin rempli d’idées, une fois descendu jusqu’à l’âme, passe par la puissance vitale de l’âme et par sa qualité dans la matière de l’univers, dans laquelle il forme certaines représentations lointaines et floues des idées comme la lumière forme sur le miroir les images des couleurs, ou mieux comme elle dessine sur le sol les ombres des corps.”

¹⁷ Athanasius Kircher, *Ars magna lucis et umbrae* (Roma: Sumptibus Hermanni Schens, 1645), p. 926: “In primo igitur ante species rerum per modum maxime unius collocantur. In secundo, sive intellectu per modum idearum plurium in mundo quodam exemplari, atque intelligibili primo. Quanto deinceps inferiorem ordinem mundi res obtinet, tanto magis et ab ipso esse intellectus primo deficiunt, et ab uno delapsae in multitudinem....”

¹⁸ Ibid., p. 925: “Angelico enim intellectui patet divinis Sol.”

¹⁹ Athanasius Kircher, *Primitiae Gnomonicae Catopticae*, p. 3: “lucis inquam foecundae radio, veluti risu quoda incitata, spirituque dilatata, in voluptates foecundo motu stimulai.”

²⁰ Ibid., p. 2: “Quid enim aliud lux a Deo, nisi immensae bonitatis suae veritatisque exuberantia? quid in Angelis, nisi intelligentiae quaedam (ut cum Dionysio loquar) certitudo a Deo manans, profusumque voluntatis gaudium? quid in caelestibus, iuxta Trismegisti mentem, illa aliud est, nisi vitae copia ab Angelis facta, virtutisque explicatio, quam Platonici risum caelorum nominant? Quid in igne, nisi vitalis quidam vigor a superioribus insitus....In iis denique quae sensu carent, nil nisi caelitus quaedam diffusa gratia, ubique divinae bonitatis, veritatisque typus et imago.”

²¹ Ibid., p. 3: “Refert itaque lumen in omnibus naturam boni incomprehensi, quam (teste Marsilio) Philosophorum nullus adhuc definivit, adeo, ut luce clarissima, nihil obscurius, nil ignotius re omnium notissima.”

²² Trans. in Fran O'Rourke, *Pseudo-Dionysius and the Metaphysics of Aquinas* (New York: E. J. Brill, 1992), p. 9.

²³ *Ibid.*, p. 19.

²⁴ Athanasius Kircher, *Obeliscus Pamphilius* (Roma: Typis Ludovici Grignani, 1650), p. 169: "Sicut enim pyramis a summo fastigio velut a puncto insipiens per lineas in superficies, et corpus aliens, paulatim in omnes partes dilatatur, sic rerum omnium natura ab unico principio, et fonte, qui dividi nequit, nempe a Deo summo opifice profecta, varias deinceps formas suscipit, ac in varia genera atque species diffunditur, omnique apici illi, et puncto, a quo omnia manant et profluunt, coniungit, quo sane optime repraesentari videtur primogenia illa mundi origo, qua omnes mundi partes conformate illam, quam nunc videmus, speciem effecerunt. Erat enim olim mundus informis et coenosus, nondum discretis rerum notis integritatem suae formae adeptus; nam neque tellus centrum suum profundamento rerum omnium stabilierat, neque coeli perpetuus motus certa fede voluebatur, sed omnia sine Solis usu immota..."

²⁵ Valerio Rivosecchi, *Esotismo in Roma Barocca* (Roma: Bulzoni, 1982), p. 122.

²⁶ Trans. in Rudolf Wittkower, *Architectural Principles in the Age of Humanism* (London: Alec Tiranti, 1962), p. 104.

²⁷ Luca Pacioli, *De divina proportione* (Milano 1957), p. 16.

²⁸ Athanasius Kircher, *Arithmologia* (Roma: Ex Typographia Varesii, 1665), p. 241: "Quemadmodum enim omnes numeri ab unitate emanant componunturque; ita ab unitate illa seu Monade supramundana, cunctae eorum quae aut intellectu concipiuntur, aut oculis perlustrantur, conditarum rerum ordines, genera, species, foecundissimae Mentis aeternae conceptu prodierunt..."

²⁹ *Ibid.*: "hinc quatuor Elementorum congeries mutuata fuit, hinc temporum vices, hinc motus astrorum, Coelique conversio."

³⁰ *Ibid.*, p. 242: "quod Deus in creatione, hoc mens nostra in numerorum productione; divina mens discernit omnia; discernit et omnia mens nostra. Sed Dei discretio rerum productio est in propria subsistentia, nostra vero solum numerorum, quae sunt divinae discretionis similitudines."

³¹ *Ibid.*, p. 250: "sic trigonus prima omnium figurarum rectilinearum, nasciturque ex binario et unitate, et in hieroglyphicis pyramidibus signatur."

³² *Ibid.*, p. 254: "Est enim haec unitas trigona prima unitas omnium superficierum, omniumque figurarum rectilinearum fons et origo..."

³³ *Ibid.*, p. 257.

³⁴ Trans. in Nicolas Cusanus, *Of Learned Ignorance* (Westport: Hyperion Press, 1979), pp. 107, 110.

³⁵ Kircher, *Arithmologia*, p. 259: "Sicuti in praecedentibus punctum Monade descripsimus, lineae vero intervallum dividua Dyade distendimus, superficiei autem latitudini Triadem indidimus; ita nunc superest, ut in corporea plenitudine et solidi profunditate quaternarius requiescat, distendatque et emetiatur potissimum corporis intervallum. Nam ut supra dictum est, quaternarius primus est corporeus solidusque numerus, producitque vel pyramidem trilateram, vel cubum."

³⁶ *Ibid.*, p. 260: "Hinc quatuor elementorum simplicia corpora, quae quadruplex generum ordo, Substantia, quantitas, qualitas, locus comitantur..."

³⁷ Ibid.: “Substantiae competit generatio et corruptio: quantitati augmentatio et diminutio; qualitati motus alterationum contrariis insistentium; loco denique latio congruit.”

³⁸ Ibid.: “Quibus quadruplex rerum ordo, subsistentium inanimatorum, viventium, sensibilium et rationalium fulcitur et conservatur.”

³⁹ Ibid.: “Atque haec est Pythagorica illa tetractys, conversos rerum ordines continens, de qua cum fuse in Musurgia nostra universali egerimus.”

⁴⁰ Ibid., p. 262: “In Monadica unitate contemplamur simplicissimam mentem omnium productricem Divinam essentiam; in secunda radicali unitate Angelicam Intelligentiam; in quadrata animam; in cubica denique corpus intuemur; ita ut hisce quaternis unitatibus distinctis, distinctas in singulis proprietatum rationes comperiamus.”

⁴¹ Kircher, *Arithmologia*, p. 250: “quod initium ducit a puncto seu Monade pyramidis, et per duo quelibet latera in basim extenditur, qua pyramidis constituitur, sacra illa et tot Antiquorum scriptis celebrata Trias, verum Platonicum triplicis Mundi exemplar et idea....”

