The Golden Pentagon of Albert Dürer in the Baroque Art of *Nouveau España*: A Case Study in an Altarpiece at an Augustinian Church in Salamanca, México

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Abstract
The present article is a review of the artistic aspects of Baroque architecture in Latin America. Special reference may be made to at least one significant pattern among others: namely, 'altarpiece' design. I shall conduct this discussion with reference to the walls of the nave of the Augustinian temple of San Juan de Sahagún in the city of Salamanca, Guanajuato, a city located in the central highlands of Mexico, also known as the "El Bajío" region. The altarpiece theme has been the subject of study by local and external researchers who have dealt with its historical antecedents, from the first Christian altars in the times of the Roman persecutions, to its appearance in the Middle Ages, and its final manifests in the splendor of the Baroque period and its arrival in America. Thus, in the colonial period of the Americas the formal elements of the Baroque were used by the colonisers to project a status symbol in front of the powerful creole and peninsular groups. But the Baroque age symbol was also an artistic expression and it combined with the culture of the indigenous world, adding to the rich body of architectural expression, material resources, diversity and contexts. Baroque synthesis also comprised spirituality and gave rise to artistic creations with specific functions within a religious system- in this case the city of Salamanca on Mexico's Bajío area. Gómez (2011) argues with respect to the purpose of the artistic object: "Altarpieces play a very special role in religious art in that they are differentiated from the rest of the liturgical material. It is also an instrument of religious stimulus for with its illustrative nature and pedagogical impacts on people visiting the church"(par.1).

Keywords: Baroque architecture, Latin America, Augustinian temple, altarpiece

The Neohispanic Baroque altarpiece of the Augustinian temple at Salamanca was completed in the years between 1768 and 1771. Two altars were installed by architect Pedro de Rojas, disciple of the master Jerónimo de Balbás, creator of the altarpieces of Perdón and de los Reyes, in the metropolitan cathedral of Mexico City. A follower of of the European and colonial artistic styles in the new continent, Maestro Pedro de Rojas is also founder and promoter of the Bajío altarpiece school based in the city of Santiago de Querétaro. The experienced art historian Guillermina Ramírez Montes highlights upon the works of this school as supplying influential art models. Pedro Rojas founded architectural models for the Augustinian order in Santiago de Querétaro, Cadereyta of the same state, San Miguel de Allende, Celaya, and Salamanca in Guanajuato, and in San Luis Potosi. On the other hand, the *side* altars of the nave are attributable in design and construction to another artist Antonio de Elexalde "the young man", of a promoter family, creator

and executor of sacred art in the Michoacan area of the Agustinian Church and rector of the Bajío area. Elexalde the creator of the altarpiece of Las Marías, thus demonstrates as follows:
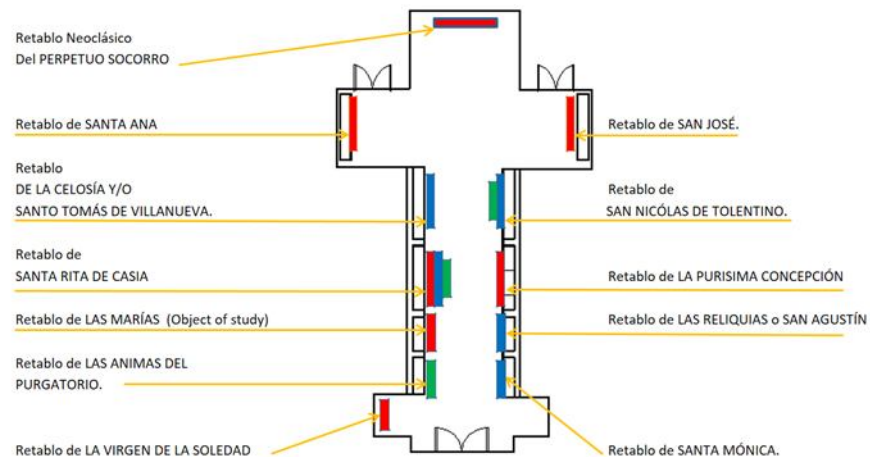
Scheme 1: Plan of the nave of the Augustinian temple in the form of a Latin cross, its main access is oriented to the north; eleven altarpieces with their main religious programs have been indicated, the third left lateral altar belongs to that of Las Marías, with a base of 4.23 meters and an estimated height of 6.00 meters; the twelfth altarpiece and the greater one, was replaced by another of the neoclassical style in the first half of the XIX century (1836-1838).

Since prehistory, human beings have tried to represent their feelings in the most diverse ways. An example is rock painting in whose extensive visual field, the paleolithic artist raises and organizes its elements and subjects of such form in such a way that the represented images register certain natural and spontaneous canons of measurement. The representation would describe the artist's perspective in relation to others, one that visually accompanies him in the composition. It is in ancient Greece that the measure was established as an attribute of the arts. In the Dialogue between Plato and Aristotle on aesthetics and art, the discourse refers to aspects that make things pleasant, in relation to beauty and number, Mur (2009) notes: "...what is really beautiful is governed by a strict proportion between the parts, always achieved by a mathematical calculation".

Both writers of universal aesthetics point out what the senses perceive through the mediation of certain qualities that involve numbers and measurement. They are categorized as canons that grant beauty to objects that human beings reproduce with relevant techniques the media of sculpture, architecture, music and poetry. New-Spanish sculptors influenced by European Renaissance art applied to the baroque altarpiece the freedom and dynamics of asymmetric curves and ornaments. The determination of patterns or canons of organization mentioned by Aristotle gives us an aesthetics related to measurement and numbers, on visuality and proportion. The Polish esthete Tartakiewicz (2000) states: No art is constituted without proportion; and the proportion lies in the number. Thus, all art is constituted by means of number ... so that there is a certain proportion in the plastic arts and also in painting, such as by means of which similarity and identity are achieved. In general, all art is a system of perceptions and the system is numerical. Therefore, it is reasonable to say that "everything looks like numbers", that is, the reason capable of judging and related to the numbers that make up all things. That's what the Pythagoreans say. (p.93)

Following precepts in the dialogue between Plato and Aristotle and the teachings of Pythagoras on beauty and its numerical principle, even and odd numbers, and primes and squares we have the golden rectangle that contains a harmonic constructive configuration of components. The geometrical foundation of any rectangle is, thanks to the Pythagorean Hypotenuse Theorem, which has established that the square of the hypotenuse of a right triangle is equal to the sum of the square of the remaining sides of the rectangle, we get the following figures:
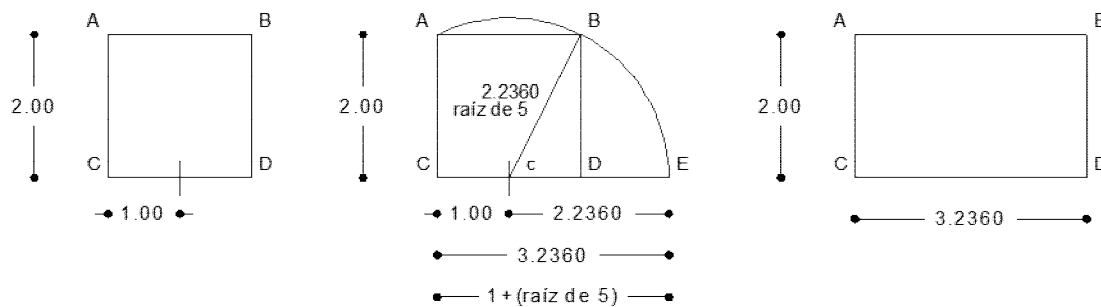

Figure 1,2 and 3, respectively from left to right.

Figure 1 shows a square "ABCD" of two by two units. If a right angled triangle is built inside it, based on the fact that the lesser leg is half of one of the sides of the square, and the long leg is equal to the full side of the square, then he quadrangular form, has the following relation: cB = $\sqrt{(cD^2 + DB^2)}$, from where a value of hypotenuse of 2.2360 units, equivalent to $\sqrt{5}$ is obtained. Assuming that the vertex c is the origin of the radius "cB", we could then draw a segment of circumference until it aligns with the side "CD" of the square "ABCD" , which now defines the new segment "CE" with a length of $1 + \sqrt{5}$ = 3.2360 units.

The resulting structure is a golden rectangle whose measurements have a 1 unit height by $1 + \sqrt{5}$ base; it can also be established that the proportional relation between the sides of the golden rectangle being $(1 + \sqrt{5}) / (2)$ is equivalent to the value of 1.6180339888 - the so-called golden number and designated by Fidias with the symbol " Φ "(fi). Parallels to these numerical relations of measure and proportion exist in the Augustinian altarpieces.

The pentagon is an equilateral and equiangular regular polygon subject to a golden proportion of isosceles triangulations with two angles of 75º. The Pythagoreans made golden applications, such as the case of the Rock Tomb of Mira in Asia Minor. Historically, these ancient aesthetic canons are replicated in the Renaissance and in a basic way in the configuration and design of bodies and streets in the ornamental Neohispanic baroque altar; and as a fulfillment of the Spanish royal ordinances exercised in New Spain, an indispensable requirement of an artistic profile mastered by Antonio de Elexalde the "young" author of the altar of Las Marías or Pedro de Rojas .

According to the Renaissance painter's treatise of Albert Dürer, the golden figure can be represented in the geometric construction of the pentagon. For example, deriving from the principles enunciated in Figure 4 a straight line "XY" may be drawn, then its mid-point "O" is located. The midpoint serves to generate a circumference with a common "OB" radius; of the line segment "OY" creating a new middle point "A" that could be used to draw a circle arc segment "BC" ("A" being the origin). From there the intersecting point "C" will be located on a segment "XA"; then with "B" as origin a new circle segment is drawn to intersect again tangentially at "d". It is at point "d" where one of the vertices of the pentagon will be located, that is, one of the sides of

this figure is "dB", and this is how this sequential geometric procedure can be implemented to determine the other four sides. Albert Dürer also considered the inclusion of the linear segments in golden ratio "of", "ef", and "fg" and analyzed the following ratio of proportionality ("eg") / ("of"). In bounded graphic units we have (2.35) / (1.45) = 1.620689655 and consequently the ratio ("de") / ("ef") = (1.45) / (0.90) = 1.61111111, which are approximations in decimals to the golden number 1.61803. This is how Dürer's method would allow geometric reference for the visual fields, total or partial areas of the integral composition. The same elements appear in their same relationships in the altarpieces of Antonio de Elexalde.
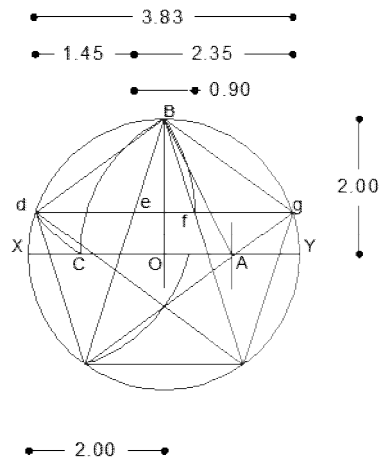

Figure 4.

When a work of art is appreciated, a series of reflections link to three areas: the work itself, the creative artist, and the context of the recipients. From the first field you can interact with the support, the frame that contains the visual field, the objective and subjective forms of its composition and a link between the selected work and its imaginative creator will be established, which generated cognitively and physically the altarpiece with its expertise combining scientific means and aesthetic patterns to solve a need for religious visual communication; Regarding the concept of the image maker and referenced with the "imaginatio" of the medieval writer Hugo de san Víctor: "The philosopher of the Middle Ages distinguishes between visible and invisible beauty; the visible, present in the form perceived by the senses (imaginatio); the invisible is captured by the intelligence (intelligentia) is the one that captures the intuitive mind and is supreme. "in Tartakiewiecz (1989); being then, that Antonio de Elexalde's baroque altar from New Spain also possesses both concepts that derive in sensory and rational aesthetic experience, visual sense and intelligence.

With the aforementioned, we also have the Greek Tekhné as the skill of the offices based on rules and regulations; and with much vigilance and attachment in the various Spanish ordinances, such as that of Seville in 1526 or 1582, and its influence on the baroque Neohispanic altarpiece design, its components and religious programs, of which Bruquetas (2006) argues:

The Mexican guild followed a process similar to the Sevillian, as they separated from the old guild of carpenters, whose ordinances had been confirmed in 1568 by the Audiencia Gobernadora of New Spain. The new ordinances for carvers, sculptors and architects it is thought, that inspired by those of Seville in 1583, were enacted in Mexico in 1589. According to them, sculptors had to know how to compose a naked figure and another dressed figure, first in drawing and then in bulk. As

well as being able to draw, they also had to cut the wood well, make a Corinthian capital and a column covered with a waist and foliage "for Roman use", a seraphim and a bird. (p.8)

The objective of the study is to examine the altarpiece in terms of two-dimensional visuality and using the geometrical constructions of the Pentagon by Albrecht Dürer. This is done in such a way that it is possible to justify the correspondence of the elements of composition. Important areas of panels of bodies and streets, cornices, niches, ornaments and relative dimensions. The geometric overlay of the altarpiece of Las Marías at the temple of Saint John of Sahagún in Salamanca., by its prominent author José de Santiago Silva (2004) and with the unbeatable photograph of Elsa Chabaud Magnus (p. 264) with the frontal view of the altar; the graphic resource has been exported to software with an educational license Autocad © to generate a scalar approximation that allows us to understand the harmonic proportions of the altar design. We observe that the altar is altered in its upper semicircular arch, there is the narrative that was not the original place of the altar, probably justification of the dimensional adjustment. In image 1 the invisible but perceptible arch of half point is interrupted by the detail of a first lower step corresponding to the left lateral extension of the choir and the median height of the nave. The width of the altarpiece is 4.23 meters and its height is estimated at 6.00 meters; therefore, the first measure was adjusted to 4.23 units in the environment of the aforementioned software, this being the recess of the altarpiece at ground level or the base-segment "AB". The initial line will be at the bottom of the pentagon. For practical reasons the procedure for obtaining the pentagon by Albert Dürer has been taken as mentioned in the work Geometric Fundamentals of Design and Current Painting by the head of the technical department of the General Directorate for the Dissemination of Science of the UNAM in 2004, Edmundo García Estevez. First it is necessary to draw two circles -like a compass-, taking as centers the points "A" with radius "AB" and "B" with radius "BA", "AB" is the base of the altar's 4.23 meters; giving as a consequence that the two circle segments intersect two points in this procedure "C" in the upper part and "D" in the lower one, which will immediately be joined with a vertical line "CD"; now again with the center identified in point "D" a circle of radius "DA" = "DB" will be drawn, with the points "E" and "F" aligned horizontally with "D", the circumference also intersecting the line "CD" at a point that will be identified with "G". Straight lines will be drawn from "E" passing through "G" and extending to the circumference originating in "B" or radio "BD" locating the tangential point "H", and symmetrically obtaining "I", from where other sides of the pentagon "AI" and "BH" are defined and finally with the compass the equidistant distances are obtained on the line "DC" giving completely the pentagonal form; and admirably it is observed that the maximum point of the pentagon would correspond to the missing top of the altarpiece and the maximum point of the half-circle arch; the internal line of the golden figure of "IH" also coincides with the upper edge of the pilasters of the third body where its capitals are perceived; the point "C" stands out and coincides with the face of the Mariana sculpture, not the stove type like the ones that accompany it in the altarpiece program, also the point "G" is occupied by the guilloche and symmetrical guilloche ornament with scrolls below the altar table; the composite pattern of the circular segments and vertical and horizontal straight lines on the altar image allow us to visualize another cornice alignment, which separates the second and third bodies from the bottom to the top; thus showing the harmony of the whole of its parts with the totality, magnificent achievement of the michoacan artist Antonio de Elexalde "El Joven", and that despite the ornamental richness of the neohispanic baroque and that it could visually wrap the receivers in a first sensitive experience, it is appropriate to reflect on the criterion applied in the dimensional and numerical proportionality of the Augustinian altarpiece. The constant aesthetic treatment in

the remaining altars of the Juan de Sahagún temple establishes a visual communication for the intangible in the tangible, and the presence of the univerals in arts.
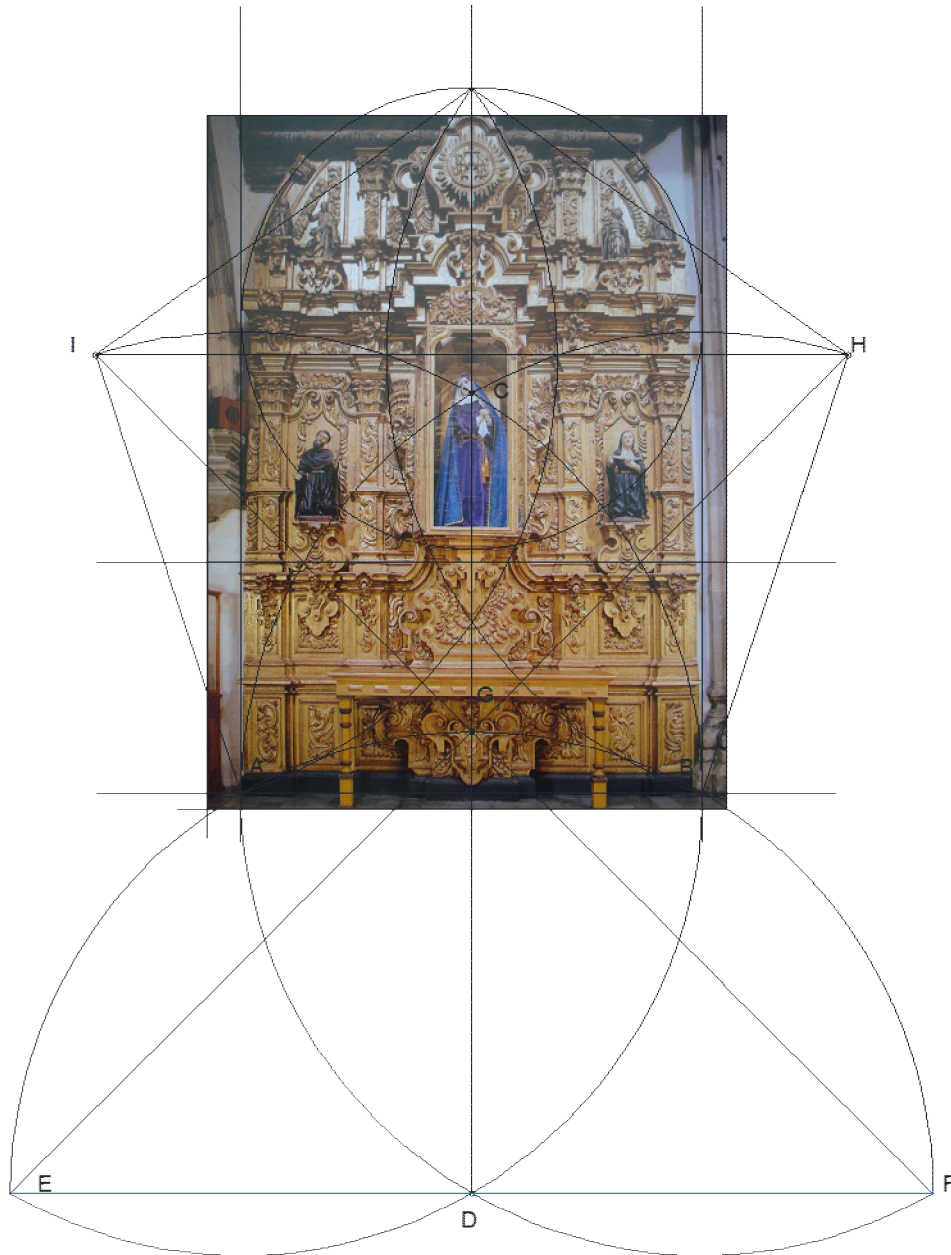

Image 1: The altarpiece is circumscribed in dimensions and extensions to the stroke of the pentagon according to the method of Alberto Durero, considering its initial stroke at the base of the altar of 4.23 meters (base of the pentagon), by means of strokes of segments of circumference and their respective radios, the strategic location of wide dividing cornices in the horizontal bodies of the set is determined, in a hidden but sensitive harmony.

Bibliography.

Bruquetas, Rocío. (2010). Los gremios, las ordenanzas, los obradores. La pintura europea sobre tabla siglos XV, XVI y XVII. Instituto del Patrimonio Histórico Español. Recuperado en http://ge-iic.com/files/Curso%20retablos%202004/R_Bruquetas.pdf

De Santiago, José. (2004). El templo agustino de fray Juan de Sahagún en Salamanca. Apoteosis barroca. 1ª. Ed. Serie arquitectura de la fe. México: La Rana.

Donis, Dondis. (2010). La sintaxis de la imagen. Introducción al alfabeto visual. España: Gustavo Gili.

García, Edmundo. (2010). Fundamentos geométricos del diseño y la pintura actual. México: Trillas.

Germani-Fabris. (1981). Fundamentos del proyecto gráfico. P.G. Prontuarios gráficos. España: Don Bosco.

Gomez, María. (2017). El retablo y su función religiosa y social. arteHistoria & Tools, S.L. https://www.artehistoria.com/es/contexto/el-retablo-su-funci%C3%B3n-religiosa-y-social

Lara, José. (2001). Salamanca, a través de los religiosos de San Agustín, (siglos XVII y XVIII). (Colección Nuevo Siglo, Serie Humanidades). México: Universidad de Guanajuato.

Mur, Pilar. (2009). Dialogo entre Platón y su discípulo Aristóteles sobre la estética y el arte. Published in Filofofia. Sarasuati PDF.

Ramírez, Guillermina. (1988). Pedro de Rojas y su taller de escultura en Querétaro. México: Dirección de Patrimonio Cultural, Secretaría de Cultura y Bienestar Social del Gobierno del Estado de Querétaro.

Tatarkiewicz, Wladyslaw. (1989). Historia de la estética II. La estética medieval. España: Akal. pp. 201-202.

Tatarkiewicz, Wladyslaw. (2000). Historia de la estética. I. La estética antigua.

Villafañe, Justo. (2006). Introducción a la teoría de la imagen. España: Pirámide.