Is Architectural Drawing a Language? Symbols, Signs, Pictograms, Ideograms and Drawings

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Abstract

Articulate language was established in the 20th century as the superior model of thought. It claimed a monopoly on the model of rational thought, even advocating a homomorphism between language and brain structure. We defend here the autonomy of architectural drawing over any linguistic discipline with the arguments that will be developed in six fields of debate. This analysis will argue why, stricto sensu*, architectural drawing should not be considered a language. In our view, drawings do not 'mean' anything; rather, they either represent or shape the world. The lack of correlation between a syntactic and semantic field denies one of the basic principles of language. Drawing, especially architectural drawing, is based on the mathematical analysis process of Euclid's geometry and does not require deductive reasoning based on logical or natural language. Neither does conceptual art based on language models seem to have produced remarkable works of art, nor has the attack on the visual brought even some of what was promised. Goodman's symbol system models have provided a more useful way to understand the specifics of architectural drawing as part of a representational symbolic system, beyond 'languages and notations'. Finally, neuroscience posits the coexistence, without privilege, of a visual cognitive style as distinct from verbal cognitive style.*

Keywords: architectural drawing, language, symbolic systems, graphic thinking, Nelson Goodman.

"In vain do we extend our view into the heavens, and pry into the entrails of the earth; in vain do we consult the writings of learned men, and trace the dark footsteps of antiquity; we need only draw the curtain of words, to behold the fairest tree of knowledge, whose fruit is excellent, and within the reach of our hand." [Berkeley 1992, p. 53].

Introduction

The 20th century was marked by the emergence of semiology, accepted as a general model for many fields of knowledge. The enormous impact that the development of modern linguistics had at the end of the 19th century meant that all artistic manifestations, whether visual, plastic or literary, were subsumed into a single set of activities that could be assimilated in their structuring to verbal language. Ernst Cassirer reminds us that Benedetto Croce, in his 1902 work [1], identified artistic activity with linguistics. The indifferentiation between the study of linguistic problems –of general linguistics– and aesthetic problems since Croce has made its weight felt during an important part of the 20th century. He reduces the entire artistic structure to a single form of linguistic production: "Croce insists that there is not only a close relationship between language and art, but a complete identity. According to his way of thinking, it is arbitrary to distinguish between the two activities. Whoever studies general linguistics studies, according to him, aesthetic problems and vice versa" [Cassirer 1968, p. 145]. On the other hand, analytical philosophy gave language a legitimate status as a model of human thought, giving rise to the 'linguistic simile', to which the theory of architecture and drawing were not alien, both being considered as a form of writing, with

the subsequent application of methodology and literary criticism. The attack on the visual, *ocularcentrism* and formalism did the rest. It was not until the second third of the century that post-structuralism questioned the legitimacy of the 'linguistic simile'. Nelson Goodman's neopragmatist analysis of symbol systems provides very relevant disquisitions on the consideration of all symbols, including, indistinctly, verbal languages, graphic languages and musical notations. Recently, neuroscience has highlighted both verbal and visual ways of knowledge.

Discussion

Many discussions have been fought to establish and overturn the hegemonic authority of the 'linguistic simile' in Western culture up to the situation we find ourselves in today. Without wishing to be exhaustive, we will point out six manifestations of the intellectual debate that have a bearing on the visual arts, architecture and architectural drawing.

As a hegemonic model of human thought

Logical positivism (scientific logical language) and analytical philosophy (natural language) bring the novel idea of a certain isomorphism between brain and language. The issue we address here is to discern whether or not architectural drawing is, properly speaking, a language. Certainly, architectural drawing is based on projective geometry. Geometry is a branch of mathematics that is rooted in the greatest monument to deductive thinking that has survived since antiquity. Euclid's *Elements* [Euclide 1991] is perhaps the best example of the power of the human mind for deductive thinking. Based on a few definitions, it is one of the intellectual pinnacles of cognition. Against this background, it is hard to understand how the recourse to the 'linguistic simile' based, at best, on logical statements whose premises have obvious weaknesses and inconsistencies compared to the powerful thinking apparatus that is geometry, has been so vehemently accepted.
We cannot affirm that the *Elements* were originally accompanied by drawings, although, already from the first book, after the Graphic demonstration of the Pythagorean theorem of the axiomatic part (23 definitions, 5 postulates and 8 common notions), the geometrical demonstrations that are described for their graphic construction follow. Proposition 47 corresponds to the graphical proof of the Pythagorean theorem which, in fact, was already known in Egypt and appears in its graphical version in the *Rhind papyrus* (1650 BC) (fig. 1). We know that some manuscript copies preserved during the Middle Ages were accompanied by illustrative drawings or diagrams. In fact, since the printing revolution, as early as 1482, an illustrated text of the *Elements* was published by Erhard Ratdolt in Venice translated from the Arabic by Adelard of Bath. This 'need' to illustrate the text with figures is already symptomatic of the limitations of verbal languages in the field of geometry; but, above all, it is revealing of the gestalt quality and holistic vision derived from visual perception: any of the graphic versions of the Pythagorean theorem does not require proof or, to be precise, constitutes the graphic proof of the theorem itself (fig. 2).

Words are pictures: languages, alphabets, pictograms and ideograms

We will focus here on the question concerning the substantial difference between verbal languages and graphic representation, whose problematic approach lies in the association between sign and meaning. Verbal languages are based on this association and require a considerable level of abstraction: a word –a precise sound composed of a combination of phonemes– is associated with a meaning. However, not all cultures have achieved a system with the same level of abstraction.
The earliest recorded attempts were logographic languages, a hybrid between graphic and textual, where each word was represented by a specific logogram. Egyptian hieroglyphs dating from before 3000 B.C. are the most figurative of these languages. Chinese uses pictograms and ideograms which constitute a synthetic figurative representation of objects and beings –a 'literal, albeit schematic, copy of their referent' [Koriat, Levy 1979, p. 355]–, while ideograms represent more abstract ideas and concepts. The first recorded dictionary of Chinese logograms, the *Shuowen Jiezi,* was compiled by Xu Shen, who also classified the structure of sinograms –the name given to Chinese logograms– into six different categories [Gándara 2014]. The most relevant for our purpose are the first three: the iconic ones, based on the similarity with the referent; the ideographic ones, which represent more abstract concepts; and the ones that combine the two previous ones.

Man', 'tree' or 'enclosure' illustrate well the iconic type, in which a graphic schematic representation of the referent can still be easily inferred (fig. 3). It is likely that the similarity between the referent and the original ancient Chinese script was greater than it is today, as, over time, the evolution of writing has blurred that similarity [Hew et al. 2012, p. 219], as was also the case with the ancient Sumerian pictograms which became stylised through their use and evolved into the characteristic cuneiform script, progressively more regular and simplified over the centuries [Torri 2012, p.127] (fig. 4). 'Above' and 'below' belong to the ideographic type, in which the ideogram represents an abstract concept described in logical or associative terms and, in this particular case, its logic is easily understood by comparison. The third type combines, for example, two or more pictographic characters to metaphorically represent a new meaning through the association of different ideograms, as is the case with 'prisoner' –a man in confinement– or 'forest' –the grouping of several trees–. The real revolution in written languages came with the use of the alphabet (fig. 4). Thus, a specific and limited set of signs made it possible to represent a virtually unlimited number of words.
However, all these signs refer to a meaning: that is the basic relationship between all these verbal languages. Moreover, looking at the different characters and logograms, it is easy to deduce the arbitrariness of both the form of the linguistic sign (for example, the alphabetic characters and the sounds they represent) as well as the association between signifier and signified. On the other hand, in graphic representation systems, in drawings, there is no arbitrariness: the projected lines correspond to the apparent edges or contours, which correspond to the projective process that guarantees the univocal correspondence between a point

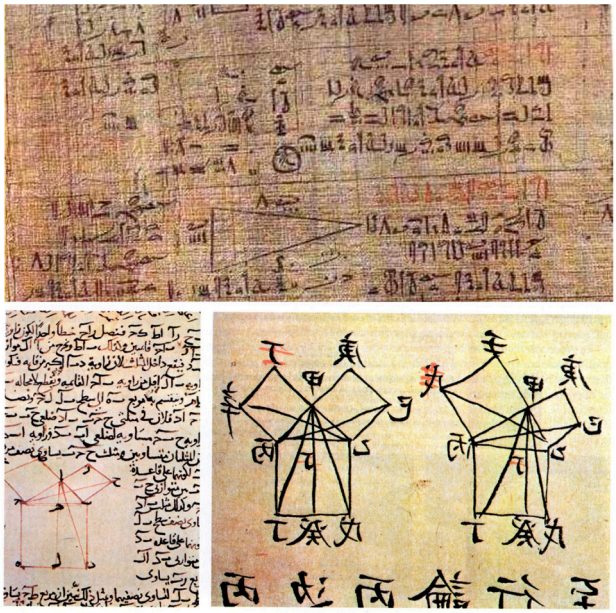


Fig. 1. Top: Scribe Ahmes, detail from the Rhind Papyrus, showing an explanation of the Pythagorean theorem (1650 BC). Below: Reproductions of fragments of translations of Euclid's Elements (I.47) where the Pythagorean theorem is graphically demonstrated [Cabezas et al. 2011 pp. 60-61].

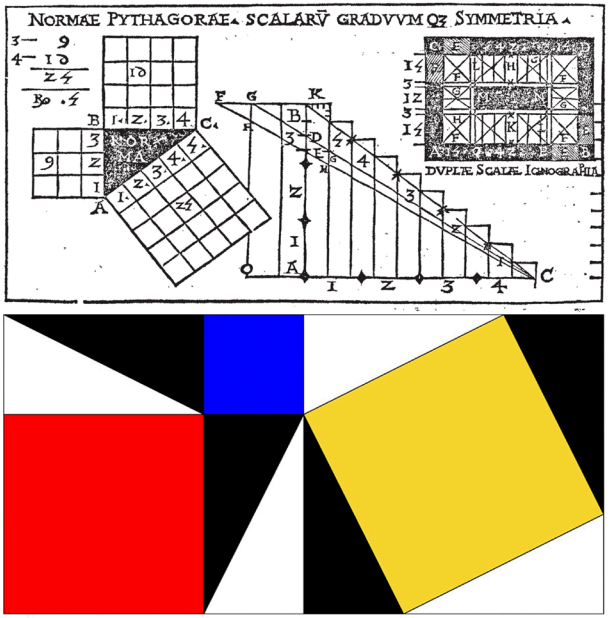


Fig. 2. Graphic demonstration of the Pythagorean theorem. Top: Cesare Cesariano Vitrubius [Cesariano 1521] and the Pythagorean triangle (3,4,5). Below: graphic elaboration by the authors, 2025, synthetic graphic demonstration of the theorem, general case, inspired in Frank Wilczek's dual complementary diagrams version [Wilczek 2016].

of the three-dimensional referent and the point of its representation on the plane or its projection on the retina.

The 'linguistic simile' and the problem of meaning

This sometimes operative metaphorical approach, and not quite so in some instances, has been applied to the visual arts in a generic sense, and also to architecture understood as a 'language'. Accepting the possibility of the existence of something similar to a syntax, the core problem lies in demonstrating the existence of a relationship between the syntactic and the semantic fields. The arguments in favor of the existence of the relation have been dismantled at the end of the 20th century on the basis of the development of powerful theories of representation in architectural drawing. We will give an account of the main arguments we are aware of: Robin Evans [Evans 1995, p. 179] points out the non-representational value of architectural drawing, as opposed to its use in painting and sculpture, since it is usually drawn prior to the existence of the architectural work: "The subject-concept [the building or space] will exist after the drawing, and not before".
Aware that the 'linguistic simile' obscures rather than clarifies the understanding of architectural drawing, he poses three critical arguments.
In the first place, he proposes to rescue architecture from the methods of literary criticism which, in the case of Derrida's work, comes to establish itself as a sub-genre of criticism by presenting architecture as a form of writing. Evans writes [Evans 1995, p. 139]: "To claim, following in the footsteps of Jaques Derrida, that architecture is a form of writing, is not something remarkable in itself after twenty years of insisting on the language model".
Secondly, he points out the use of linguistics as a theoretical support, as a way of self-protection of the work produced by architects in the face of the criticism that he coins as the 'linguistic alibi'.
Finally, he acknowledges the contribution of Peter Eisenman, who considers the existence of a certain deep syntactic structure –generative grammar– in the sense established by Chomsky, akin between language and architecture [Gandelsonas 1998] as a 'useful analogy'. Evans admits the sincere effort and the steps taken by Eisenman, although he opposes a naive identification: "All things with a conceptual dimension are like language, just as all grey things are like elephants" [Evans 1997, p. 168].
Roger Scruton [Scruton 1979] accepts the existence of a certain syntax and a possibility of correspondence of signifiers with a semantic field for some cases of highly codified classicist architecture, taking Summerson [Summerson 1963] as an authority on this matter, who also refers to classical treatises; but he denies the existence of a relationship that can be generalised to all works of architecture. Elsewhere [Scruton 2017, p. 146], he analyses the process of constructing the meaning of the works, albeit far from the 'linguistic simile'. He dismisses the need to call 'grammar' what is traditionally called 'style'. His strong argument is about how a sentence with incomplete syntax cannot convey meaning; whereas an incomplete architecture manifests its stylistic unity with all its meaning. He concludes that in architecture it is the dependency between the parts and the whole that which gives meaning.
Jorge Sainz [Sainz 1990] takes as his basis the structuralist analysis by Mounier and the semiological analysis by Umberto Eco. His conclusion is clear: architectural drawing only fulfils one of the six conditions that a system of symbols must fulfil in order to be considered a language and he points out the non-existence of an associated semantic field. He states that "for the followers of Saussure it would be one more of the sign systems of a non-linguistic character". It is also worth making a distinction between three ways of approaching architecture itself, as Sainz points out [Sainz Avia 1990, p. 21]: texts (theory), drawings (praxis) and architecture itself (built work). To suggest that architecture possesses a meaning as if a work were a signifier with significance produced the excesses of historicist postmodernism led by Venturi [Venturi 1982] in the 1970s.

pictogram	人	man
pictogram	木	tree
pictogram	口	enclosure
ideogram	上	above
ideogram	下	below
compound ideogram	囚	prisioner
compound ideogram	森	forest

Fig. 3. Table of Chinese ideograms and their meanings.

Fig. 4. Left: sumerian cuneiform inscription. Center: Tang Dynasty (copy of 新婦地黃湯帖*) by Wang Xianzhie. Right: alphabetic characters from an inscription from the era of Trajan (c. 114 A.D.).*

The attack on the visual

Structuralism and the 'linguistic simile' advanced in parallel, strengthened by the support of a theory with aspirations of becoming a universal epistemology, and was the favourite tool of the theoreticians in the face of the old formalism, where artists and some critics took refuge. Art theorists such as Joseph Kosuth [2] then, or Nicolas Bourriaud [Bourriaud 2009] recently, –both with a sociological background–, have recounted how the crisis of the value granted to the visual as opposed to the conceptual or relational took place. Bourriaud [Bourriaud 2009, p. 104] turns to Robert Morris [3] to explain it: "Conceptual art thus affirmed the end of the primacy of the visual in the perception of the work of art."
Kosuth's own installation (fig. 5), as Magritte had done earlier in his famous *Leci n'est pas une pipe* (fig. 6), already implies a revision of the problematic and elusive relationship between the work and the representation of reality, as well as its autonomy with respect to the referent that it uses as a pretext to conform itself. Kosuth's own 'real' chair, which is referred to in the photograph, a projection after all, and also in the accompanying text, forms part of the work. But even in this installation, we can observe the incomparable supremacy of the graphic over the verbal when it comes to describing material reality.
In fact, the merciless critique of the pre-eminence of the visual in art [4] has constituted the central nucleus of the theoretical-artistic debate during the second half of the twentieth century or, to be more precise, from 1968 onwards; and the leading role fell to French theorists with structuralist and psychoanalytical roots. Authors such as Martin Jay [5] attribute this to the strong influence that French thought had on American art criticism. He points to two vectors that sparked the revision of what he calls '*ocularcentrism*' [Jay 2003]: on the one hand, the enormous influence of the work of Marcel Duchamp [6], and on the other, the thought of philosophers with structuralist roots that arrived in the USA at the end of the 1960s, fundamentally the works of Ferdinand de Saussure, Claude Lévi-Strauss and Roland Barthes [Barthes 1986]. Jay identifies three critical lines. We will focus on the debate around the first line, which opposes language and textuality to visual perception. The possibility of 'reading' a painting, a building, a drawing was imposed on the simple idea of 'looking'.
In the artistic practice of these years –grouped as conceptual art– the boundary set by Duchamp of 'art as an idea' was crossed to extend it to art as a philosophy, as information, or as linguistics (fig. 5). The characteristics common to all the activities enacted by conceptual artists can be recognised in the following words of Robert Smith [7]: "Despite their extreme diversity, what united most conceptual activity was an almost unanimous emphasis on language or linguistically analogous systems, and the conviction –confident and puritanical in some circles– that language and ideas were the true essence of art, that plastic experience and the delectation of the senses were secondary and inessential, if not obtuse and unmitigatedly immoral" [Stangos 1986, pp. 214-215].

Fig. 5. Joseph K. One and Three Chairs (1965). Folding wooden chair, photograph, enlarged dictionary definition; chair 82.2 x 37.7 x 53 cm, photo panel 91.4 x 61.2 cm, text panel 61.2 x 62.2 cm. Collection of MoMA, New York. Larry Aldrich Foundation Fund.

Fig. 6. Magritte, R. Ceci n'est pas une pipe (1928–1929). Los Angeles County Museum of Art (LACMA).

Here we identify, in our opinion, one of the most successful campaigns to overthrow the hegemony of the linguistic and conceptual approach to the 'arts of drawing' which had dominated the Fine Arts since the days of Vasari and which had its roots in the time of *L'Accademia delle Arti del Disegno*, the consequences of which are still being experienced today.

The transition from the structuralist model to the symbolic model. A theory of representation versus a theory of signification.

"Allographic art has not emancipated itself by dint of vindication but by dint of notation" [Goodman 1976, p. 118]. In the 1960s and 1970s, Maldonado writes [Maldonado 2004, p.34]: "architecture was then understood as a system of visible signs. All architectural discourse was presented as a discourse on signs. Some studies directly proclaimed the birth of a new discipline: the semiology of architecture" and the establishment of something akin to an architectural semiology was pursued.
Nelson Goodman overcomes the disconnection between the syntactic and semantic fields –pointed out by Scruton in the case of architecture– and the idea of drawing as language.
Goodman's symbol systems go beyond the scope of language to encompass any kind of symbol, including drawings and, in particular, architectural drawings [Goodman 1976]. A symbolic schema correlated with a field of reference would provide the minimum semantic requirements to be considered a symbolic system. Modes of referencing include exemplification and denotation, the latter encompassing both description, characteristic of linguistic systems, and representation, characteristic of representational systems. A symbol system in its fullness would attain the status of a notational system, and Goodman himself states that we should refrain from considering figurative systems as languages, 'however tempting it may be'.
A discontinuous, syntactically and semantically differentiated digital system, if it is also unambiguous, will be a notational system. The non-projective, dimensioned sketch made by Coderch of the pines and carob trees located on the plot where he will built the Ugalde house is an example of a digital drawing (fig. 7).
On the other hand, analogical systems: dense, continuous, syntactically and semantically undifferentiated; are

the opposite of a notational system. A figurative graphic system –and any projection is necessarily one– is based on similarity (fig. 8).
In addition to this radical distinction: linguistic systems vs. representational systems, Goodman distinguishes between allographic and autographic arts. A work will be autograph if, and only if, the distinction between the original and its most exact copy is important. Architectural paintings and sketches are autographs; scores and plans are allographs.
Goodman differentiates two broad groups of architects' drawings: sketches –images produced to reflect the appearance of the finished building– and architects' plans, which: "would be a combination of a sketch and a script" [Goodman 1976, p. 200]. They are a mixture of specifications written in ordinary discursive verbal and numerical language with a sketch: "Since a plan is a drawing, with lines and angles subject to continual variation, one might think that technically it is a sketch. But on the plan, measurements appear in words and numbers" [Goodman 1976, p. 200]. And he concludes that numbers do not violate the conditions of notation, due to the usual limitation to two decimal places, and this "supposes a sufficient restriction for finite differentiation, and therefore they will count as notation, and, consequently, the drawing will not be analyzed as a sketch, but as a digital diagram and as a score" [Goodman 1976, p. 200]. In this way, Goodman recognizes the notational status of the architect's drawing, which he assimilates to musical scores.
The notational system of architectural drawing was already anticipated by Alberti in his *De re-aedificatoria* published as early as 1485, laying the foundations for the representation of architecture by means of parallel projections and granting the status of the architect as responsible for a task of an intellectual nature through the mediation of drawing as a tool of control and planning [Carpo 2011, p. 20]. Not long after, the representation of architecture was refined to constitute the canon proposed by Castiglione and Raphael de Sanzio in their famous letter to Pope Leo X in 1519 [Castiglione 1978]. The systematic use by architects for centuries of the section, the plan and the elevation points to the solvency of a representation system based on the parallel projections of three canonical and complementary views (fig. 9).

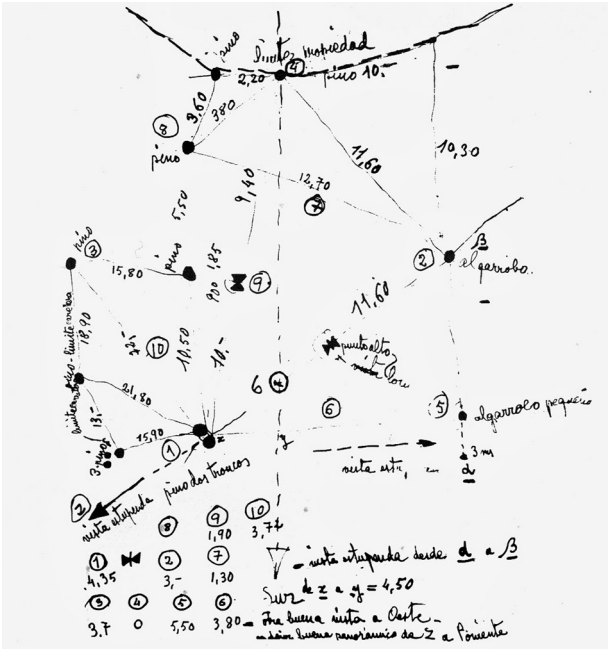


Fig. 7. Coderch, J.A. Sketch of Casa Ugalde, 1948.

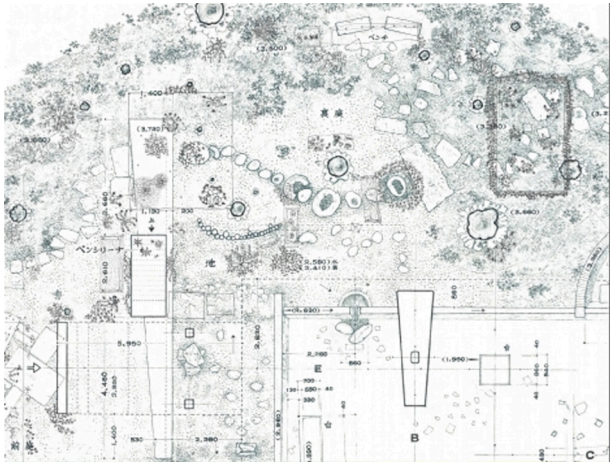
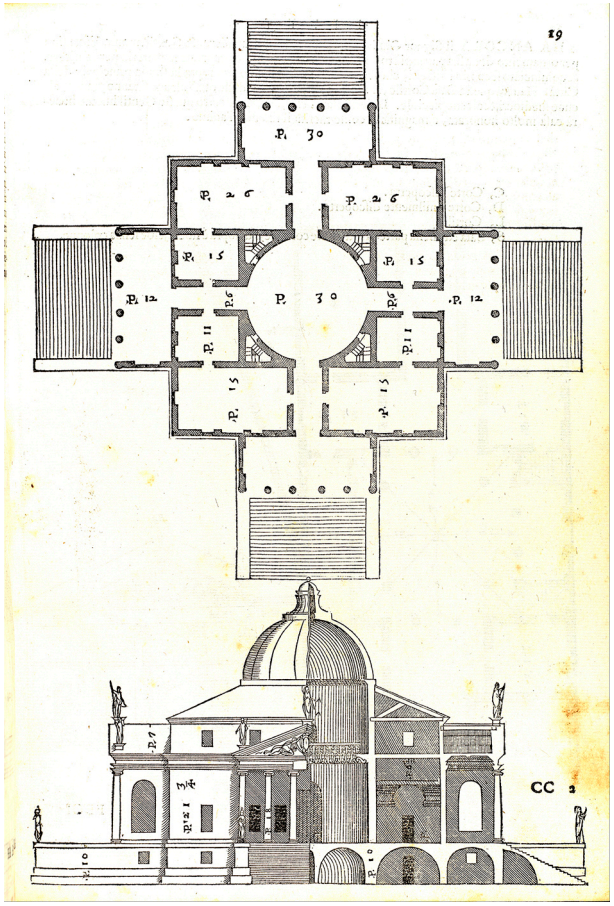


Fig. 8. Ishigami, J. Japanese Pavilion at the 2008 Venice Biennale.

Fig. 9. Villa Almerico (Villa Rotunda), from I quattro libri dell'architettura [Palladio 1570, p. 19].



Epilogue: A Cognitive Model

Finally, we briefly note the current trend in the study of cognitive processes to understand the world. Howard Gardner [Gardner 2011] expands the field of human intelligence beyond linguistic or logical-mathematical intelligence. Chomsky, a disciple of Goodman, initiated the transition from language as a system (Saussure) to language as an innate mental process. Later, neuroscience took over the study of human cognitive processes. According to Benjamin Bergen [Bergen 2012], the revolution begins when the 'language-meaning-thought' binomial breaks down, anticipating that 'meaning', rather than being related to abstract symbols, could be something intimately intertwined with individual experiences of the world's reality (embodied) through simulation. Furthermore, he argues for the existence of different cognitive styles: verbal and visual, present in all individuals to a greater or lesser extent. Graphic thinking would find in drawing a vehicle for elaborating ideas and developing knowledge linked to the material world.

Conclusions

We have presented a set of arguments put forward in the debate surrounding the classification of architectural drawings as a type of language. If we examine this debate, we see that it is a derivative of other, more profound issues, such as the consideration of architecture as a language, the visual and spatial arts as a language, and even the identification of language with thought, whether formally logical or heuristic, encompassing all human epistemological processes. If we observe its temporal course, we see that it emerged in the late 19th century, reached its zenith in the 1960s and 1970s, and lost its vigor towards the end of the century.
Architectural drawing is the repository of a set of specific characteristics that mark its own autonomous line. The identification of human thought with a linguistic model based on the formal logic of scientific language advocated by logical positivism in order to maintain the rigor of deductive thinking, in addition to being challenged by some of its proponents –including Wittgenstein– seems unnecessary for architectural drawing, given the geometric-mathematical roots of its relationship with rational, deductive thought. The projective nature of architectural drawing establishes a direct link between the object of thought and

its representation through a logical process based on Euclidean geometric support.
The "linguistic simile" requires compliance with a set of rules specific to a linguistic symbolic system that architecture, neither as a work nor as a drawing, fulfils; specifically, the necessary relationship between the syntactic field and the semantic field, since architectural works and drawings do not "mean" anything.
The development of Goodman's symbolic systems model distinguishes between clearly differentiated modes of reference: descriptive and representative denotation, separating verbalized language from graphic representation and placing them in two independent spheres. Furthermore, the specific study of architects' drawings has allowed for a precise classification of them based on their analogical or digital nature, and their allographic or autographic character, which is much more precise than any linguistic interpretation.

Finally, the development of new currents in cognitive psychology establishes a disparity in models of human intelligence where formal thought is disassociated from the monopoly of logic, language, and mathematical reasoning [Gardner 2011] to open up to cognitive styles specific to human beings where verbal abilities are equated and separated from visual abilities, both necessary for a correct formulation of the configuration of the world.
The use of the linguistic simile that considers architectural drawing as a language should not, in our opinion, be used in a literal sense. Although its use in a metaphorical or instrumental sense may be useful, we must be aware that such use can contribute to disseminating a confusing idea that runs counter to the intrinsic and autonomous value that architectural works and architectural drawings possess by nature.

Notes

[1] Aesthetics as the Science of Expression and General Linguistics, with its first edition in Italian in 1902 and the first in Spanish in 1912, with a prologue by Miguel de Unamuno [Croce 2014].

[2] Joseph Kosuth built his artistic production within a theoretical framework that explained and legitimized his work, which would become the conceptualist manifesto Art After Philosophy, published in 1969.

[3] Robert Morris (1931–2018) was a sculptor, writer, and conceptual artist. He is considered one of the leading theorists of minimal art, along with Donald Judd.

[4] On the aesthetic predominance of language, see Chapter VI of José Jiménez's book, *Images of Man. Fundamentals of Aesthetics.* 1986, Madrid: Tecnos.S.A. José Jiménez Jiménez is Professor emeritus of *Aesthetics and Theory of the Arts* at the Autonomous University of Madrid. He was the founder and director of the Institute of Aesthetics and Theory of the Arts. In his youth, he studied in depth the philosophy of symbolic forms of E. Cassirer [Cassirer 1968].

[5] Martin E. Jay is Professor of the *History of Ideas* at the University of California, Berkeley, where he has taught since 1971. Born in New York City in 1944, he graduated from Union College, studied at the London School of Economics, and earned his Ph.D. in Philosophy from Harvard University.

[6] The disdain for Duchamp's "retinal art" extended to both realist painting and the two-dimensionalism that he initiated against Impressionism and later extended to "abstract painting." See: [Jiménez 2013, 1:25:00].

[7] Robert Smith is the author of the text "conceptual art" selected for the Nikos Stagos anthology referred to above.

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