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The conceptual and perceptual natures of architectural form in Le Corbusier's *Vers une architecture*.

Paul Zucker, in his article “The Paradox of Architectural Theories at the Beginning of the ‘Modern Movement’”, 1951, contended that at the time when the Modern Movement was being born, art and architectural theorists, particularly those belonging to the German tradition, were not addressing the issue at the root of a new development in art which, according to Zucker, was functionalism. Instead of dealing with the question of functionalism, theorists like Schmarsow, Worringer or Hildebrand were concentrating their interest on perception. Therefore, Zucker concluded that “the basic theoretical concepts in Germany seem to contradict the prevailing trends of the creative architects then at work.”¹

In our view, there was no such contradiction, since the perception of form and space was, as much as functionalism, a major concern for modern architects. Perception was certainly a major issue in Le Corbusier's theories, especially in those formulated in “Vers une architecture”. The main subject-matter of Le Corbusier's text is FORM, more precisely, ARCHITECTURAL FORM. We will argue in the following discussion, that the notion of architectural form contained in this text has two distinct natures – conceptual, perceptual – and that Le Corbusier's ideal was to subsume the two distinct natures under one unique architectural form.

The first architectural thought

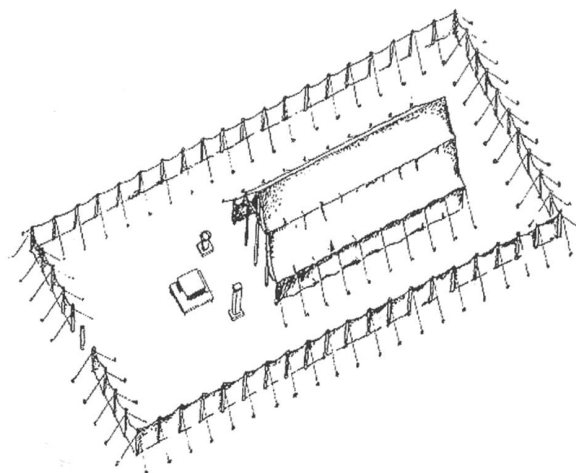
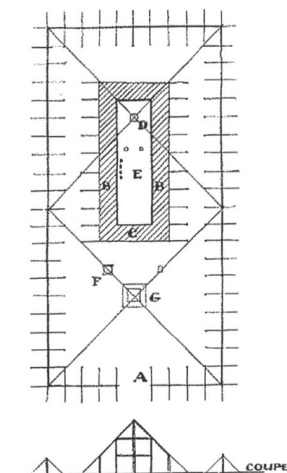
In “Vers une architecture”, Le Corbusier includes his particular account of the origins of architecture, in which he emphasizes the intellectual aspects involved in the creation of the first building: “L'homme primitif a arrêté son chariot, il décide qu'ici sera son sol. Il choisit une clairière, il abat les arbres trop proches, il aplanit le terrain alentour; il ouvre le chemin qui le reliera à la rivière ou à ceux de sa tribu qu'il vient de quitter; il

fonce les piquets qui retiendront sa tente. Il l'entoure d'une palissade dans laquelle il ménage une porte. Le chemin est aussi rectiligne que le lui permettent ses outils, ses bras et son temps. Les piquets de sa tente décrivent un carré, un hexagone ou un octogone. La palissade forme un rectangle dont les quatre angles sont égaux, sont droits. La porte de la hutte ouvre dans l'axe de l'enclos et la porte de l'enclos fait face à la porte de la hutte”² (Figures 1, 2). The most relevant aspect of the first building of Le Corbusier are the geometric figures, like the square, hexagon or octagon; symbols of the “mathématique primaire”. Architecture is, therefore, a “pure création de l'esprit”; a statement which, incidentally, reproduces almost literally the ideas expressed by Boullée one century earlier.³

Le Corbusier's description of the origins of architecture is basically the description of the first architectural thought: “Il n'y a pas d'homme primitif; il y a des moyens primitifs. L'idée est constante, en puissance dès le début.”⁴ For Le Corbusier, architecture did not originate as an imitation of nature, as Vitruvius had suggested.⁵ Rather, architecture was, from the very beginning, a conscious act of intellectual creation made with the conceptual tools with which the mind is equipped, namely, geometry and mathematics. This explicit reference to the conceptual tools of the mind distinguishes Le Corbusier's ideas about the origins of architecture from the previous ones of Vitruvius and Laugier.⁶

The perceptual nature of architectural form

Since at least the Renaissance, architects have been concerned with the effect that the form of their buildings had on the beholder. In the Preface of Book IV, in the “Quattro Libri”, Palladio writes that churches should be built “in such a manner and with such proportions, that all the parts together may convey a sweet harmony (una



Figures 1, 2: Le Corbusier, *Vers une architecture: le temple primitif*.

soave armonia) to the eyes of the beholders.”⁷ Later, Boullée thought that the use of simple geometric volumes guarantees a pleasant effect on the viewer. He praised regular forms because “Dans l’ensemble, l’ordre des choses doit être combiné tellement que nous puissions d’un coup d’oeil embrasser la multiplicité des objets qui le composent.”⁸

The value that Le Corbusier assigns to the perceptual nature of architectural form, makes him a direct follower of Palladio and Boullée and, in general, of all those architects and theorists who in the past had advocated the intelligibility of architectural forms. Thus, Le Corbusier praises simple volumes because “les formes primaires sont les belles formes parce qu’elles se lisent clairement.”⁹ Similarly, the following account of the perception of architectural form/space, could also have been subscribed by Boullée: “L’oeil du spectateur se meut dans un site fait de rues et de maisons. Il reçoit le choc des volumes qui se dressent à l’entour. Si ces volumes sont formels et non dégradés par des altérations intempestives, si l’ordonnance qui les groupe exprime un rythme clair, et non pas une agglomération incohérente, si les rapports des volumes et de l’espace sont faits de proportions justes, l’oeil transmet au cerveau des sensations coordonnées et l’esprit en dégage des satisfactions d’un ordre élevé: c’est l’architecture.”¹⁰

As Palladio and Boullée had done, Le Corbusier also expressed his rejection of the Gothic style.¹¹ He contended that the forms of the Gothic do not have a ‘plastic’ quality, meaning that they cannot be seen in terms of primary solids: “L’architecture gothique n’est pas, dans son fondement, à base de sphères, cônes et cylindres ... Une cathédrale nous intéresse comme l’ingénieuse solution d’un problème difficile, mais dont les données ont été mal posées parce qu’elles ne procèdent pas des grandes formes primaires. La cathédrale n’est pas une oeuvre plastique; c’est un drame: la lutte contre

la pesanteur, sensation d’ordre sentimental.”¹² Unlike the Gothic, there were other styles whose forms, according to Le Corbusier, could be perceived as simple geometric figures. For example: “L’architecture égyptienne, grecque ou romaine est une architecture des prismes, cubes et cylindres, trièdres ou sphères: les Pyramides, le Temple de Louqsor, le Parthénon, le Colisée, la Villa Adriana.”¹³ The ‘perceived form’ is for Le Corbusier as real as the ‘actual form’ of the building. When he describes the Parthenon, he does not ‘see’ the actual classical columns; he sees instead cylinders: “La lumière étend son impression au dehors par les cylindres (*je n’aime pas dire colonnes, c’est un mot abîmé*) des péristyles ou les piliers”¹⁴ (Figure 3).

What distinguishes Le Corbusier from other architects who had previously expressed similar thoughts regarding the perceptual nature of architectural form, is that for Le Corbusier the ‘mode of perception’ has also a conceptual value. In Le Corbusier’s thought, as much as in his buildings, perception and conception become equated: when he sees the Parthenon he thinks of cylinders; and when he conceives a building he thinks of compositions of solids. Architectural forms do not only have to *appear* as geometric solids; they must *be* geometric solids. In this regard, it is understandable that he admired buildings like silos, whose forms *are* in fact cylinders.

Tracés régulateurs: the link between conception and perception

Conceptual and perceptual are for Le Corbusier two inseparable natures of one and the same architectural form. The purpose of the *tracés régulateurs* is precisely to provide a method to achieve the ideal architectural form, one in which the conceptual and perceptual dimensions reach a maximum of identity.

The traces are geometric diagrams that Le Corbusier draws over the elevations of some memorable buildings of the past, like Notre Dame in Paris or the Capitolium at Rome. This sort of geometric diagrams, superimposed on the elevations of buildings, were not a discovery of Le Corbusier. Their origin should be traced back to an old tradition related to the classical doctrine of proportions.

It seems to be certain, however, that the direct source of inspiration of Le Corbusier's traces were the illustrations of Auguste Choisy's "*Histoire de l'Architecture*" (Figure 4). Choisy already realized that his diagrams could have a double meaning, perceptual and conceptual. He thought that they could be seen as tools for analysis of historical works but also as instrument for design.¹⁵

Similarly to Choisy's diagrams, Le Corbusier's traces also had a perceptual and conceptual meaning. In its perceptual sense, the traces are the outline that the eye recognizes in a well-proportioned building. In this regard, he thinks that "*le tracé régulateur est une satisfaction d'ordre spirituel qui conduit à la recherche de rapports ingénieux et de rapports harmonieux. Il confère à l'oeuvre l'eurythmie.*"¹⁶ But he also thinks that the *tracés régulateurs* have a conceptual value since they are an instrument that guarantees a correct design, or as he says, they are "*une assurance contre l'arbitraire.*"¹⁷ The traces, therefore, are the link between two realms, conceptual and perceptual: "*Le tracé régulateur apporte à l'oeuvre cette mathématique sensible qui nous donne la perception bienfaisante de l'ordre*"¹⁸ (Figure 5).

Perception and representation

It might seem contradictory, that while Le Corbusier defends the use of the *tracés régulateurs* to design, he criticizes at the same time the artificiality of the Beaux-Arts method of composition. There is, however, some fundamental differences between the two methods, as he explains it: "*les axes de L'Ecole des Beaux-Arts sont la calamité de l'architecture. L'axe est une ligne de conduite vers un but. En architecture, il faut un but à l'axe. A l'Ecole on l'a oublié et les axes se croisent en étoiles, tous vers l'infini, l'indéfini, l'inconnu, le rien, sans but. L'axe de l'Ecole est une recette, un truc.*"¹⁹

The difference between the two methods is the difference between two conceptions of geometry that are contained in the previous passage: one strictly conceptual, the other mostly perceptual. When geometry is thought in purely abstract terms, lines become abstractions having no relation whatsoever with the viewer's perception of the building. They are basically "lines on a piece of paper", as in the Beaux-Arts method of composition. But when geometry is considered as the link between the sensible and abstract worlds, as in his description of the Acropolis²⁰, lines become lines of vision and movement (as opposed to purely abstract entities) that make space intelligible to the viewer: "*Dans la réalité, les axes ne se perçoivent pas à vol d'oiseau comme le montre le plan sur la planche à dessin, mais sur le sol, l'homme étant debout et regardant devant lui.*"²¹

What Le Corbusier rejects is then the architecture that has been conceived only through abstract geometry, with complete disregard of the perceptual dimension. He criticises, for example, the star-like plan of Versailles as well the radial plan of Karlsruhe saying that, in those plans, the axes, tending towards the infinite, cannot be perceived by the eye, and that the star-like form of the plans can only be seen from a bird's eye but not from the eye level. Therefore, star-like forms only make sense in the drawing, but they have nothing to do with the experience of architecture. They are an example of what he calls the "illusion des beaux plans". At this point, Le Corbusier reminds then that "*l'homme voit les choses de l'architecture avec ses yeux qui sont à 1m.70 du sol*"²², meaning that the ultimate purpose of the architectural form is to appear intelligible to the viewer, and not only to the architect drawing the plan on paper.

While advocating both dimensions of geometry, abstract and sensible, Le Corbusier was again acknowledging the two components of architectural form: conceptual and perceptual.

The identity of the sensible and the abstract worlds

The interweaving of conceptual and perceptual realms that characterizes Le Corbusier's thought, is also present in his already classical definition of architecture: "*L'architecture est le jeu savant, correct et magnifique*

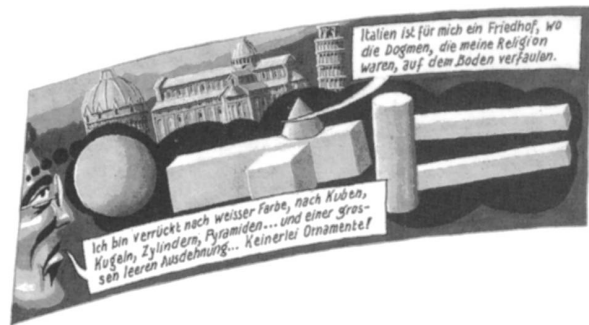


Figure 3. Le Corbusier's world of perceptual figures. From Sambal Oelek, *Jünglingserwachen*.

des volumes assemblés sous la lumière.”²³ According to this definition, it is no longer possible to establish a clear distinction between the world of senses and the world of intellect. In effect, in Le Corbusier's definition we find that a “volume”²⁴, that in principle should be taken as a geometric entity, is illuminated by the “lumière”, a sensible phenomenon. But the same definition could also be interpreted in a different way, in which the abstract/conceptual character of the words “volume” and “lumière” is reversed. Thus, it is possible to think of “volume” as a perceived solid or mass, while “lumière” is understood in a figurative sense, as an “enlightenment” associated with the act of intellectual understanding. The fact that both interpretations are possible, only confirms the exchangeability of the conceptual and perceptual realms in Le Corbusier's thought.

Conclusions

Is Le Corbusier's notion of architectural form still a valid reference for our contemporary architecture? In some of the architecture of the last decade, the tension between conceptual and perceptual realm has shifted towards the conceptual side, at the expense of the perceptual one. An unprecedented emphasis on the geometric nature (in the conceptual sense only) of architectural form distinguishes some of the avant-garde architecture of today.

Moreover, in some of today's architectural productions, the beholder has stopped being at the center of the architect's concern. No longer considered as the ultimate protagonist of the aesthetic experience, the beholder has been consciously ignored or even neglected. Accordingly, architectural forms do not have to be anymore intelligible, but puzzling; they should not convey an intellectual order, but mostly should intrigue the viewer. Furthermore, architectural scale, understood as the relation between the form of the building and the beholder, has stopped being a concern for some contemporary architects. As a result of this denial of scale, a finished building is likely to appear to the eye of the spectator as an enlarged object rather than a properly scaled architectural form.

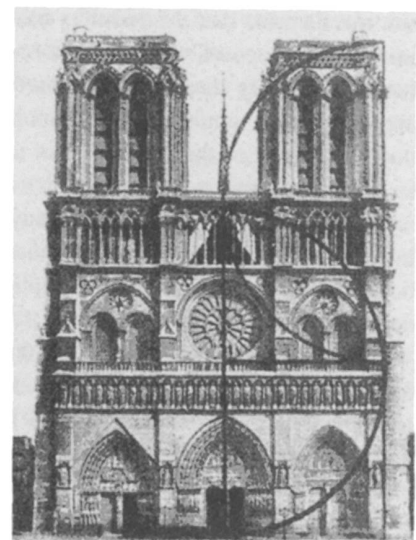
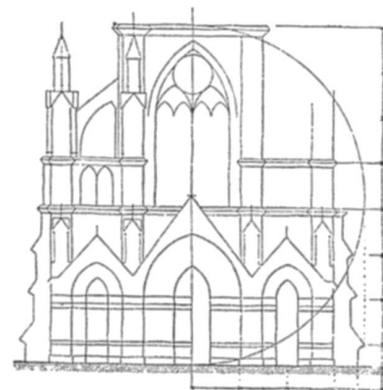


Figure 4. A. Choisy. *Les rapports simples* in a Gothic facade of the XIIIth century.

Figure 5. Le Corbusier. *Les tracés régulateurs* superimposed on a photograph of Notre-Dame.

Indeed, the main goal for some of today's avant-garde seems to be to create the most complicated (as opposed to complex) form. Contemporary advocates of formal complexity seem to ignore that complex (as opposed to complicated) architectural forms have existed in almost every time, and that in most cases, formal complexity was achieved without having necessarily to remove issues like architectural scale, symbolism, structural logic and functional adequacy from the architectural discourse (e.g. Gaudí's Casa Milà, Le Corbusier's Ronchamp).

With regard to the symbolic meaning of today's architectural forms, this needs to be found in the ingenious mechanisms that the architect has devised to come up with the supposedly original and revolutionary forms (sometimes, only shapes, rather than forms). Yet, there are other cases, among some recent architectural productions, in which the symbolism of a building form is so evident that this can only be seen as an enlarged version of the object it represents. In any case there is an intention to endow architectural forms with subtle symbolic meanings, that invites the complicity of the beholder (e.g. villa Rotonda, villa Savoye).

Finally, an evident risk of this emphasis on geometric form, which distinguishes some of today's architecture, is that other natures of architectural form (perceptual, structural, functional, symbolic and ornamental) can be undervalued or even ignored. As a result, there is today a tendency to reduce *architectural form* to *geometric form*. In this regard, the critique of Le Corbusier to the Beaux Arts method of composition could be equally extended to the eminently geometric conception of architectural form of our time.

The present article is a revised extract from the author's Ph.d. thesis: The Concept of Type in Architecture. An Inquiry into the Nature of Architectural Form, ETH Zurich, 1995.

1 P. Zucker, "The Paradox of Architectural Theories at the Beginning of the 'Modern Movement'", In the *Journal of the Society of Architectural Historians*, vol. 10, n. 3; Oct. 1951.

2 Le Corbusier, "Vers une architecture". Paris: Les éditions G. Crès et Cie; 1923, p. 53.

3 Boullée wrote: "il faut concevoir pour effectuer. Nos premiers pères n'ont bâti leurs cabanes qu'après en avoir conçu l'image. C'est cette production de l'esprit, c'est cette création qui constitue l'architecture." E. Boullée, *Architecture. Essai sur l'art*. Paris: Hermann; 1968, p. 49.

4 Le Corbusier, *op.cit.*, p. 53.

5 Vitruvius described the construction of the first shelters as the result of the first assembly of men around fire: "(men) began in that first assembly to construct shelters. Some made them of green boughs, others dug caves on mountain sides, and some, in imitation of the nests of swallows and the way they built, made places of refuge out of mud and twigs". Vitruvius, *The Ten Books of Architecture*. New York: Dover Publications, Inc.; 1960 [1914], (II, 1, 2).

6 Even though the primitive hut of Laugier can be understood more as a perceptual form than as an actual model to imitate, he -like Vitruvius- thought that architecture was born as imitation of nature. Thus, he wrote that "Il en est de l'Architecture comme de tous les autres Arts: ses principes sont fondés sur la simple nature, & dans les procédés de celle-ci se trouvent clairement marquées les règles de celle-là." M. A. Laugier, *Essai sur l'architecture*. Bruxelles: Pierre Mardaga, éditeur; 1979 [1755], p. 8.

7 Quoted in R. Wittkower, *Architectural Principles in the Age of Humanism*. New York: Academy Editions, St. Martin Press; 1973, p. 110.

8 Boullée, *op. cit.*, pp. 76-77.

9 Le Corbusier, *op. cit.*, p. 13.

10 *Ibid.*, p. 35.

11 Palladio had once claimed that the Gothic style "should be called confusion and not architecture". Quoted in E. Panofsky, *Meaning in the Visual Arts*. Penguin Books; 1993 [1955], p. 240. Boullée, without mentioning the Gothic, rejected irregular forms on the following terms: "Composée d'une multitude de faces toutes différentes, la figure des corps irréguliers, comme je l'ai remarqué ci-dessus, échappe à notre entendement". Boullée, *op. cit.*, pp. 62-63.

12 Le Corbusier, *op. cit.*, p. 19.

13 *Ibid.*, pp. 16-19.

14 *Ibid.*, p. 150.

15 "Les proportions des édifices sont-elles régies par ce vague sentiment de l'harmonie qu'on nomme le goût, ou bien résultent-elles de procédés de tracé définis et méthodiques?" A. Choisy, *Histoire de l'Architecture*. Paris: Editions Vincent, Fréal & Cie.; 1954, vol. I, p. 48.

16 Le Corbusier, *op. cit.*, p. 57.

17 *Ibid.*

18 *Ibid.*

19 *Ibid.*, p. 151.

20 "L'axe de l'Acropole va du Pirée au Pentélique, de la mer à la montagne. Des Propylées, perpendiculaire à l'axe, au loin à l'horizon, la mer. Horizontale perpendiculaire à la direction que vous a imprimée l'architecture où vous êtes, perception orthogonale qui compte." *Ibid.*

21 *Ibid.*

22 *Ibid.*, p. 143.

23 *Ibid.*, p. 16.

24 In principle, the word volume denotes the space occupied by a solid. However, in French, volume is also used in the arts to express the plastic character of a solid or mass, as it appears to the eyes of the viewer under certain conditions of light and shadow. Certainly, with this definition Le Corbusier wanted to convey a pictorial view of architecture. The interpretation we are proposing here does not contradict this view. On the contrary, it stresses the mixing of abstract and sensible realms that are embedded in his definition of architecture.