

THE ARCHITECTURAL PRECEDENT AND THE DIAGRAM:
A COMPARATIVE ANALYSIS OF LE CORBUSIER'S VILLA SAVOYE
AND REM KOOLHAAS' MAISON A BORDEAUX

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ALPER KÜÇÜK

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
ARCHITECTURE

SEPTEMBER 2007

Approval of the thesis:

THE ARCHITECTURAL PRECEDENT AND THE DIAGRAM:
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ABSTRACT

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September 2007, 107 pages

The last decade of the 20th century witnessed a revival of interest in the idea of diagrams in many disciplines, including architecture. Thus, terms like 'diagram architecture' and 'diagrammatic practice' have started to dominate the architectural discourse, both in theory and practice. Although much of the contemporary work examined under the rubric 'diagram architecture' celebrate diagram's capacity to generate new ideas and forms and embrace the diagram as a tool to revolt against the authority of established architectural traditions (such as design and planning methods, typological solutions), this study, in a critical attempt, underlines diagram's role as a mnemonic tool mediating what the architectural history and tradition hand down to us. While the significance of diagram's share in the generative activities of architectural design is acknowledged, it is proposed that diagram's role as an antidote for precedence is overemphasized and misleading, and that its repetitive character in form generating procedures through the study of architectural precedents should come under scrutiny as well. To achieve a better understanding of the mediating role of diagrams as mnemonic tools in architectural design, this study presents a comparative analysis of Le Corbusier's Villa Savoye and Rem Koolhaas' Maison a Bordeaux. The idea of this comparison is borrowed from Anthony Vidler and its model is an adaptation based on the comparative formal analysis employed by

Colin Rowe in his seminal “Mathematics of the Ideal Villa” to compare Palladio’s Villa Malcontenta and Le Corbusier’s Villa Stein. Rather than an exhaustive diagrammatic analysis, the comparison is instrumentalized to initiate a dialogue between the two buildings in an attempt to highlight the relation between architectural precedents and diagrams. The study also aims to cast light on the issues related with the contemporary architectural discourse of diagrams.

Keywords: precedent, diagram, comparative analysis, diagram architecture

ÖZ

MİMARİ ÖNCÜLLER VE DİYAGRAM: LE CORBUSIER'İN VİLLA SAVOYE VE REM KOOLHAAS'IN MAISON A BORDEAUX PROJELERİNİN KARŞILAŞTIRMALI ANALİZİ

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Eylül 2007, 107 sayfa

Geçen yüzyılın doksanlı yıllarından itibaren oluşmaya başlayan ve diyagram kavramının canlandırılmasını amaçlayan disiplinlerarası alan, mimari teori ve uygulama alanında 'diyagram mimarlığı' olarak tanımlanan oluşuma kaynaklık ediyor. Bu başlık altında incelenebilecek çalışmaların önemli bir bölümü diyagramların yeni biçim ve düşüncelere kaynaklık etme potansiyeli üzerinde durarak, diyagramı yerleşik mimari geleneklere karşı bir başkaldırı aracı olarak yorumluyor. Bununla birlikte bu çalışma, diyagramların mimarlık tarihi ve geleneklerinden gelen birikimin aktarılmasına aracılık eden bellek araçları olduğu savına dayanıyor. Bu aracılığın ve diyagramların bellek araçları olarak rollerinin doğasının daha iyi kavranabilmesi amacıyla Le Corbusier'in Villa Savoye ve Rem Koolhaas'ın Maison a Bordeaux binalarının karşılaştırmalı bir çözümlemesi sunuluyor. Bu karşılaştırma fikrine Anthony Vidler'in bir önermesi ilham kaynağı olurken, karşılaştırmının modeli Colin Rowe tarafından "Mathematics of the Ideal Villa" makalesinde Palladio ve Le Corbusier binalarının karşılaştırılması için kullanılan analiz yönteminin adaptasyonu üzerine kuruluyor. Bu karşılaştırma, diyagramlara dayalı kapsamlı bir analiz olmaktan çok, söz konusu iki bina arasında mimari öncüller ve diyagramların ilişkisinin kavranabilmesine olanak verebilecek bir diyalog kurulmasını amaçlıyor. Bu çalışmanın aynı zamanda diyagram

konusuyla ilintili çağdaş mimarlık tartışmalarının sorunsallaştırdığı konulara da ışık tutması hedefleniyor.

Anahtar sözcükler: diyagram, mimari öncüller, diyagram mimarlığı, karşılaştırmalı analiz

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CHAPTER 1

INTRODUCTION

The more you try to explain an epoch, the more you are convinced that the images you thought were created by a given poet were, in reality, passed on to him by others with hardly a change.¹

So simply to pronounce a legal innovation, to discriminate the new, our jurist is obliged to consult the old and existing; and it is only by reference to these that a genuine innovation can be proclaimed. For are not precedent and invention opposite sides of the same coin?²

Taking its initial impact and curiosity from the field of interest in the idea of diagrams that emerged in the last decade of the 20th century, this study presents a comparative analysis of Le Corbusier's Villa Savoye and Rem Koolhaas' House at Bordeaux. The idea of this comparison is borrowed from Anthony Vidler³ and its model is an adaptation based on the comparative formal analysis employed by Colin Rowe in his seminal "Mathematics of the Ideal Villa" to compare Palladio's Villa Malcontenta and Le Corbusier's Villa Stein.⁴ Rather than an exhaustive diagrammatic

¹ Viktor Shklovsky, "Art as Device" in *Theory of Prose* (Illinois: Dalkey Archive Press, 1998), 2.

² From the letter written in 1986 to the editors of *The Harvard Architecture Review*, about their topic "the use of precedent and the role of invention in architecture today". See Colin Rowe, "Letter: On Precedent and Invention," *The Harvard Architecture Review Vol.5* (1986). Reprinted in *As I Was Saying: Recollections and Miscellaneous Essay, vol. 2* (Cambridge: The MIT Press, 1996), 370.

³ Anthony Vidler, "Diagrams of Diagrams," *Representations* 72 (2000); and *Histories of the Immediate Present: Inventing Architectural Modernism, 1930-1975* (PhD. Dissertation, Delft University, 2005).

⁴ Colin Rowe, "The Mathematics of the Ideal Villa", in *The Mathematics of the Ideal Villa and Other Essays*, (Cambridge: The MIT Press, 1995).

analysis⁵, the comparison is instrumentalized to initiate a dialogue between the two buildings in an attempt to highlight the relation between architectural precedents and diagrams, and to achieve a better understanding of the mediating role of diagrams as mnemonic tools in architectural design. The study also aims to cast light on the issues related with the contemporary architectural discourse of diagrams.

1.1. Subject

1.1.1. Precedent

A precedent is a person or a thing that comes prior in time and that serves as an example or a model through analogy. The most significant use of precedent is in law, in which a decision in a prior case, mostly in a binding way, affects the judgment at stake. Thus, an exhaustive knowledge and accumulation of precedents, or at least accessibility to such an accumulation for browsing is vital in the practice of law.

Similarly, designers heavily depend on the study of precedents in their design activities. Put briefly, a designer is supposed to have a good command or acquire the habit and ability to access the records of what has been done before, prior to tackling a similar design problem. According to Christopher Alexander, this is necessitated by the growing complexity of the problems confronting the designers which force the experience and intuition of individuals to obsolescence in problem solving and which drive them towards the comfort of pre-existing solutions.⁶ At

⁵ As exemplars of such diagrammatic analysis on Villa Savoye, see Roger H. Clark and Michael Pause, *Precedents in Architecture* (New York: Van Nostrand Reinhold, 1996), 80-81 as well as Geoffrey H. Baker, *Le Corbusier, an Analysis of Form* (Hong Kong: Van Nostrand Reinhold, 1989), 195-213.

⁶ Christopher Alexander, *Notes on the Synthesis of Form* (Cambridge: Harvard University Press, 1964).

first glance, this may seem paradoxical for a culture that often elevates creativity and innovation above other concerns (such as functional and structural efficiency), however, as we are reminded by Colin Rowe, one almost always depends on a model to be able to judge whether a creation is a leap forward, or mere repetition.⁷ According to Rowe, all cultural production (such as language and habitual patterns) is dependant on precedence and therefore it is not even possible to sustain a simple conversation, let alone tackle complex design problems without resorting to precedence.⁸ Alexander's and Rowe's views explain briefly the reliance on precedents in architectural practice and pedagogy.

In architectural context, although by definition, any prior building may serve as a precedent, there is a need to sustain an analogy between the existing building and the design problem in hand and such analogy can be established in varying ways, such as the type of the building, the function(s) it has to hold or the main organizing principle. Architectural portfolios, books, periodicals and manuals were (and still are) important references to browse and study precedents, and their efficiency can be multiplied through the potential of computerization.

Conventionally and traditionally, a precedent refers to a building or a project (that mostly belongs to a well-known designer), however, it is possible to import precedents from outside the field of architecture. In a discussion related with this possibility, Gabriela Goldschmidt makes a distinction between a reference and a precedent, to emphasize the former over the latter about their impact on creativity, mostly in the context of computer aided architectural design.⁹ According to her, precedence acts 'within domain' and therefore is usually limited with the use of a building of

⁷ Colin Rowe, "Letter: On Precedent and Invention".

⁸ Ibid.

⁹ Gabriela Goldschmidt, "Creative Architectural Design": Reference versus Precedence," *Journal of Architectural and Planning Research* 3 Vol.15 (1998): 258-270.

a well known contemporary designer (in whole or some of its parts) as the model for an architectural solution of a specific problem. References, on the other hand, for her, can act 'between domains' and promote creativity by providing for a free selection of analogies and metaphors relatively from a larger field without imposing predetermined architectural solutions. To strengthen her argument, she refers to Le Corbusier's Ronchamp Chapel, and mentions "a host of analogies, metaphors and other visual sources in the design of this building".¹⁰ Goldschmidt claims that instead of consulting a series of architectural precedents of churches and chapels from 'within domain', Le Corbusier's free associations to several visual sources from both within and between domains that are not directly linked to the context allowed him to establish "an unshakable foundation for the newly emerging form".¹¹

While Goldschmidt's distinction seems convincing at first glance, some problems emerge at further scrutiny. First of all, her preference for phrasing is problematic in that a reference and a precedent are related (a reference involves a precedent and a precedent exists in reference to something or someone coming later in time), but it could be misleading to use them alternatively in place of one another. Secondly, where a precedent comes from (whether it acts within domain or in between domains) is less important than how it is interpreted and implemented in the solution of a design problem. To go beyond formal concerns, a precedent should be analyzed and conceptualized to get to its essence, in which diagrams play an important role.

¹⁰ Ibid., 264. These sources vary from a crab shell to elements of vernacular architecture.

¹¹ Ibid., 265.

1.1.2. Diagram

As powerful tools of abstraction providing visual and graphic clarity, diagrams help to render complex relations, ideas, concepts, forces and structures visible and comprehensible, which may tend to remain blurred, uneasy to grasp, hermetic and unnoticed otherwise. Thus, they are widely employed in many fields and procedures of several disciplines as well as architecture, to analyze, understand and describe existing situations, relations, structures, works and ideas of others as well one's own.

Etymologically and literally, the word diagram refers to an act carried out with the help of lines¹², therefore architecturally any line drawing such as plans, sections, elevations, perspectives or axonometric drawings, both freehand and hard-line, can be employed as a technique in constructing a diagram.¹³ In some instances, even abstract models can serve as diagrams, in which they are used either for clarification of a design idea or as a source for interpretation toward generation of ideas and forms. By deliberately focusing on the essence through concepts and ideas while eschewing or disregarding the representation of exact appearances and formal qualities, architectural diagrams are also provocative tools to suggest alternative possibilities toward generation of form. With this ability to concentrate on conceptual issues and relations rather than formal representation, they are instrumentalized in the extension of the design process to allow flow and conversion of information into the context of the architectural problem, as well as to avoid early formal or typological fixations in the solution. The revival of interest in and the contemporary discussions on the idea of diagrams dominating the architectural discourse since mid-1990s largely originate from this potential of diagrams.

¹² Diagram comes from the Greek word *diagramma*, that refers to something marked out by lines. [INTERNET, WWW], ADDRESS: <http://www.merriam-webster.com/dictionary/diagram> [Last accessed: 16SEP2007].

¹³ January 2006 issue of the *Architectural Review* dedicated to the idea of diagram is a recent catalog of different types of architectural diagrams.

1.2. Context

An interdisciplinary field and a research community have emerged in the last decade of the 20th century on the idea of diagrams. This community consists of researchers and practitioners from as many divergent fields as applied psychology, cognitive science, linguistics, visual programming, data visualization, graphic design, education, history and philosophy of science, and architecture.¹⁴ There has been a series of gatherings in the form of symposia, conferences and workshops since the beginning of the 1990s bringing together many researchers under the umbrella of the curiosity whether there is a science of diagrams.¹⁵ The architectural community was inspired by this revival of interest. However, it must be noted that the architectural production slightly deviated from the interdisciplinary field, possibly due to the schizophrenic nature of architecture oscillating between the sciences and the arts. It can be claimed that the scientific discourse focused on reassigning diagrammatic representation systems their eroded value against sentential or verbal representation systems¹⁶, however, architecture almost exclusively dwells and depends on diagrammatic representation. Thus, in addition to the individual contributions from the architectural field to the interdisciplinary

¹⁴ The grouping is taken from Alan F. Blackwell and Yuri Engelhardt, "A Taxonomy of Diagram Taxonomies", in *Proceedings of Thinking with Diagrams 98: Is there a science of diagrams?*, 60-70. [INTERNET, WWW], ADDRESS:<http://www.cl.cam.ac.uk/~afb21/publications/TwD98.html>

¹⁵ A chronology of the series is as follows: Reasoning with Diagrammatic Representations (1992 AAAI Spring Symposium); TVL 96: International Workshop on Theory of Visual Languages In conjunction with AVI 96 (May 30, 1996 Gubbio, Italy); TwD97: Thinking with Diagrams 97 (January 9-10, 1997, Portsmouth, UK); TVL 97: International Workshop on Theory of Visual Languages In conjunction with VL 97 (September 27, 1997, Capri, Italy); DRII: Reasoning with Diagrammatic Representations II 1997 AAAI Fall Symposium (November 8-10, 1997, Cambridge, Massachusetts, USA); TwD98: Thinking with Diagrams 98 (August 22-23, 1998, Aberystwyth, UK); FRVDR 98: Formalizing Reasoning with Visual and Diagrammatic Representations 1998 AAAI Fall Symposium (October 23-25, 1998 Orlando, Florida, USA); Diagrams 2000: 1st International Conference on the Theory and Application of Diagrams (September 1-3, 2000, Edinburgh, Scotland, UK); Diagrams 2002: 2nd International Conference on the Theory and Application of Diagrams (April 18-20, 2002, Callaway Gardens, Georgia, USA); Diagrams 2004: 3rd International Conference on the Theory and Application of Diagrams (March 22-24, 2004, Cambridge, UK).

¹⁶ Mark Greaves, *The Philosophical Status of Diagrams* (Stanford: CSLI Publications, 2003).

discussions,¹⁷ a whole theoretical and practical architectural discourse has emerged along with the rise of the interest in the idea of diagrams. As a result, terms like 'diagram architecture' and 'diagrammatic practice' have started to dominate the discourse. Some architectural periodicals dedicated special issues to the diagram, such as *Any* (no.23 1998), *OASE* (no.48 1999), *Daidalos* (no.74 2000) and the *Architectural Review* (no.1307 2006), while Peter Eisenman published his oeuvre under the name *Diagram Diaries* in 1999.¹⁸ Seemingly, the coining of the term 'diagram architecture' belongs to Toyo Ito¹⁹ and the phrasing 'diagrammatic practice' can be found among the descriptions of the proponents of such practice regarding their own philosophies and practices²⁰, as well as among the writings of critics such as R. E. Somol and Stan Allen.²¹ Despite the promise of unification under such rubrics, the contemporary theoretical and professional architectural production related with diagrams displays a significantly wide range of scope and content. And although it is possible to sort out repeating names, themes and traits²², it seems difficult to achieve a consensus even in the definition of the terms. For instance, according to R.E. Somol,

A diagrammatic practice (flowing around obstacles and yet resisting nothing) - as opposed to the tectonic vision of architecture as the legible sign of construction (which is

¹⁷ To name a few, Ellen Yi-Luen Do and Mark D. Gross, "Thinking with Diagrams in Architectural Design," *Artificial Intelligence Review* 15 (Netherlands: Kluwer Academic Publishers, 2001); Fehmi Doğan and Nancy J. Nersessian, "Conceptual Diagrams: Representing Ideas in Design", in M. Hegarty, B. Meyer, N. Hari Narayanan (Eds.), *Diagrammatic Representation and Inference : Second International Conference, Diagrams 2002*, 353-355.

¹⁸ Peter Eisenman, *Diagram Diaries* (London: Thames and Hudson, 1999).

¹⁹ Toyo Ito, "Diagram Architecture," *El Croquis* 77(1) (1996): 18-24. Ito uses the term to refer to and describe the architecture of Kazuyo Sejima.

²⁰ For instance, UN Studio refers to their practice as being diagrammatic and claims to have overcome the shortcomings of a representational practice by importing diagrams from outside architecture. See Ben van Berkel and Caroline Bos, *Move*, Vol.2 (UN Studio, 1999).

²¹ R.E. Somol, "Dummy Text, or the Diagrammatic Basis of Contemporary Architecture" in Peter Eisenman, *Diagram Diaries* (London: Thames and Hudson, 1999), 6-25; Stan Allen, "Diagrams Matter," *Any* 23 (1998): 16-19.

²² For an initial exposure to the idea of diagram architecture and verbalization of the resultant formal landscape see Anthony Vidler, "Diagrams of Diagrams: Architectural Abstraction and Modern Representation".

intended to resist its potential status as either commodity or cultural speculation)-multiplies signifying processes (technological as well as linguistic) with a plenum of matter, recognizing its signs as complicit in the construction of specific social machines. The role of the architect in this model is dissipated, as he or she becomes an organizer and channeler of information, since rather than being limited to the decidedly vertical-the control and resistance of gravity, a calculation of statics and load-“forces” emerge as horizontal and nonspecific. And it is by means of the diagram that these new matters and activities-along with their diverse ecologies and multiplicities-can be made visible and related.²³

Ben van Berkel and Caroline Bos relate the issue with the problem of representation and typologies:

Diagrammatic practice delays the relentless intrusion of signs, thereby allowing architecture to articulate an alternative to a representational design technique. A representational technique implies that we converge on reality from a conceptual position and in that way fix the relationship between idea and form, between content and structure. When form and content are superimposed in this way, a type emerges. This is the problem with an architecture that is based on a representational concept: it cannot escape existing typologies.²⁴

Thus, the diversity and multiplicity of the uses of diagram define the boundaries of a problematic field which, according to Vidler, involves “a wide range of approaches and styles that at first glance seem entirely disparate – from diagrammatic caricature to theoretical discourse, modernist revival to digital experiment”.²⁵ Loyal to its abstract and provocative nature, the diagram has seemingly instigated popularity in an array of diverse approaches and interpretations towards creation of new forms and ideas. This study acknowledges the significance of the recent interpretations of diagrams in bringing certain freshness to architectural practice, and in opening new horizons of architectural thought, however, it remains at a critical distance in observing the current discussions.

²³ R.E. Somol, “Dummy Text”, 24.

²⁴ Ben van Berkel and Caroline Bos, *Move*, Vol.2, 21.

²⁵ Anthony Vidler, “Diagrams of Diagrams”, 18.

Therefore it should be noted in passing, that before even crystallizing into more or less a definition of a certain style or movement, the rubric “diagram architecture” has already started to instigate a resistance in its critics as many as Anthony Vidler, Fredric Jameson and Hyung-min Pai.²⁶ Apparently, some more time is needed before the discussions simmer down and architectural historians and critics can assess the accumulation of arguments in a more meaningful way.

1.3. Problem

While it can be claimed that working or studying with the aid of diagrams makes one’s life easier, to study diagrams themselves can be a very difficult task. Not only is it very hard to recognize, discriminate and classify diagrams on the basis of drawing types and techniques, but the nature of architectural diagrams suffer from some form of bipolarity on many levels, as well. On the one hand, diagrams are celebrated for their capacity to prevent the leaking of predetermined typological solutions into the design process and early formal fixations. On the other hand, it can be claimed that they are concise graphic tools related with the faculty of memory that promote easy retrieval and repetition. What’s more, the abstraction ability which provides diagrams with their original power also

²⁶ While Vidler underlines the stylistic shortcomings of the digitalization in architecture, Jameson detects traps of capitalism by referring to the architecture of Greg Lynn and Ben van Berkel as “the anything goes of the new generation of computer-generating blob architects”. On the other hand, Pai includes the work of Peter Eisenman and a group of followers from the “younger generation immersed in the potentials of the computer” such as Ben van Berkel, Caroline Bos and Greg Lynn in the project of postmodern opposition and although he separates their efforts from those of historicist revivalism, he thinks the route they take leads to redundancy. According to him, in this discourse, some form of authority (the architect) is substituted for another one (the computer), and, the representational techniques which the diagrammatic practice is striving to come up with alternatives against, namely the plans, sections, and elevations are already diagrams, which lead those efforts to obsolescence. See Anthony Vidler’s *Histories of the Immediate Present: Inventing Architectural Modernism, 1930-1975* and “Toward a Theory of Architectural Program” *October* 106 (Fall 2003): 59-74. Also see Fredric Jameson, “Future City,” *New Left Review* 21 (May June 2003): 72 and Hyung-min Pai, *The Portfolio and The Diagram* (Cambridge: MIT Press, 2002), 285.

works in the opposite direction to reduce their value as reliable tools of representation communicable to a wider audience. In most cases, diagrams become too abstract and highly personal through their customized aspects, that it becomes difficult for others to deduct information without additional support or the amount of shared knowledge drops considerably while the room for interpretation is enlarged. For instance, while it can be claimed that a floor plan drawn properly according to architectural drawing standards is almost universal, a plan diagram lacking scale and precise formal representation may lead to several diverse interpretations. What's more, there may be several diagrams at work in an architectural project. Although the conceptual diagrams are usually regarded as the noble seed from which a set of interpretations stem in the early stages to constitute the final design, in most cases other diagrams are needed to analyze the context and to elaborate the initial ideas into well structured solutions. In this complex process, it becomes a difficult task to discriminate which diagram matters the most and therefore is the most significant. And to make things even more complicated, in recent discourse the metaphorical resonances of architectural diagrams are thrust forward, in which almost anything leading to a theoretical opening or creation of new form may come to be treated as a diagram. This perspective has instigated a shift from understanding the diagram as an architectural artifact, a mere graphical representation to seeing it as an invisible socio-political device: On the one hand they are representational tools immersed in the descriptive and generative operations of the architectural form-giving and drawing conventions, dealing with more tangible forces and techniques such as plans, sections, axonometric projections and even models. On the other hand they are political and cultural devices immersed in the socially and politically driven operations, dealing with more abstract forces, which emerge as the consequence of a tendency that is largely inspired and nurtured by Michel Foucault's and Gilles Deleuze's interpretations on the

idea of diagrams, and is reflected to the architectural practice through the medium of computers, in most instances.

Obviously, there is nothing wrong about importing knowledge from other disciplines and exploiting the potential of computers in search for the production of new form and word. Thus, one can find exquisite examples of formal virtuosity in the work of the proponents of diagram architecture such as Kazuyo Sejima, Greg Lynn, and UN Studio, or one can discover new paths of architectural thought in the writings stemming from the idea of diagrams. What seems to be not working well, at least in a certain strand of such practice exemplified by Toyo Ito's reading of Sejima's architecture (which provided the genre its rubric) or Lynn and UN Studio's rising against the shortcomings of the traditional form-giving procedures, is the attempt to disguise their formal experiments and highly stylistic preferences under the rubric 'diagram architecture' or 'diagrammatic practice'. Their retreat to the assumed objectivity of the diagrams and their attempt to find justification for their architecture in the diagram discourses through condemnation of what is handed down by tradition (planning methods, typological solutions, etc.) are not free from flaws and inconsistencies.²⁷ This tendency to quote whatever fits the moment renders their arguments less convincing and their forms more stylistically mannered, which confine their production within the limits of architectural fashions soon to be replaced by another wave. What they seem to be deliberately disregarding is the fact that the employment of diagrams (whether imported from outside architecture or derived from architectural

²⁷ For instance, Ito's claim that Sejima's avoidance of typological solutions by eliminating customary planning methods through immediate conversion of the initial diagram into building is not clarified with examples. He also passes over how the initial diagram emerges without reference to precedents. It would be more realistic to assess Sejima's work as a continuation of modernist predecessors as extending the legacy of their vocabulary into the new millenium, rather than as an effort to establish a break with the past. Thus, Pierluigi Nicolin includes Sejima's name in the fourth generation of Japanese architects that introduce modern architecture to Japan. This generation, according to Nicolin, "has been influenced by the new context of technology and the media and is distinguished by its experimental research into personal styles of expression". See Pierluigi Nicolin, "The Tao of Sejima," *Artforum* 96 (1998): 9.

precedents) do not guarantee pure authenticity and objectivity, contrarily, they may serve as mnemonic tools through the medium of which what is inherited from previous generations can be internalized and then repeated.

1.4. Proposition

Although much of the contemporary work examined under the rubric 'diagram architecture' celebrate diagram's capacity to generate new ideas and forms and embrace the diagram as a tool to revolt against the authority of established architectural traditions (such as design and planning methods, typological solutions), this study, in a critical attempt, underlines diagram's role as a mnemonic tool mediating what the architectural history and tradition hand down to us. While the significance of diagram's role in the generative activities of architectural design is acknowledged, it is proposed that diagram's role as an antidote for precedence is overemphasized and misleading, and that its repetitive role in form generating procedures through the study of architectural precedents should come under scrutiny as well. There are cognitive studies in computer aided design based on diagram's potential in compression of information in graphic form, as well as in recognition, retrieval and interpretation of precedents, which support the view regarding the diagram as a mnemonic tool.²⁸ The phrasing 'mnemonic tool' is borrowed from David Dunster²⁹ and diagram's repetitive character

²⁸ To name a few, Stephen M. Ervin, "Designing with Diagrams: A Role for Computing in Design Education and Exploration" in Mc Cullough (ed.), *The Electronic Design Studio* (Cambridge: MIT Press, 1990), 107-122; Mark D. Gross, "The Electronic Cocktail Napkin- a computational environment for working with design diagrams," *Design Studies* 17 (1996): 53-69; Ellen Yi-Luen Do, "What's in a Diagram that a Computer Should Understand?", *CAAD Futures '95, The Global Design Studio*, Tan and Tech (eds.), National University of Singapore, 469-482; Ömer Akın, "Case-based Instruction Strategies in Architecture" *Design Studies* 23/4 (2002): 407-431.

²⁹ David Dunster, "Design Essence," *Architectural Review* 1306 (2006): 28-31. "If there is a diagram", writes David Dunster, "which can be repeated to friends and colleagues, even used in a

in relation to schemata and precedents is inspired by E.H. Gombrich's inquiry into the psychology of pictorial representation.³⁰ This study adopts Bryan Lawson's view that designers rely on their schemata and accumulation of precedents, in which diagrams play an important role in the analysis, recognition and retrieval of precedents and the linking of schemata to architectural solutions.³¹ It also adopts Gombrich's and Colin Rowe's distinction of schemata and precedents which serve as "standards of comparison" without which "we can not grasp reality"³² and "proclaim genuine innovation".³³ While acknowledging the significance of designers' schemata and accumulation of precedents as well as the significance of diagram's mediating role between what is already existing and what is yet to come, it is also submitted that in most instances, designers (even novices) are expected to be innovative and to go beyond mere repetition of patterns and typological solutions. Some of the modernist architectural production, for instance, is criticized for their uncritical loyalty to canonic modernist diagrams.³⁴ According to Gombrich, what separates simple reproduction from innovation and creativity in arts (especially pictorial representation) is the ability to receive the schemata only to "articulate them beyond recognition".³⁵ In architectural context, to achieve such transformation, most designers (are expected to) adopt or develop techniques (Lawson refers to these as architectural tricks or gambits) to operate on their schemata in their design activities towards meeting the expectations of innovation and

future monograph, then there is a mnemonic, something to remember, an easily repeatable set of lines".

³⁰ E.H. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* (Edinburgh and London: Phaidon Press, 1977, [1959])

³¹ Bryan Lawson, "Schemata, Gambits and Precedent: Some Factors in Design Expertise," *Design Studies* 25 (2004): 443-457.

³² E.H. Gombrich, *Art and Illusion*, 151.

³³ Colin Rowe, "Letter: On Precedent and Innovation".

³⁴ Klaus Herdeg, *The Decorated Diagram* (Cambridge: The MIT Press, 1983); David Dunster, "Design Essence" (2006), 29. While Herdeg refers to the reproduction of abstract modern space only to differ in the envelope, Dunster writes that "mechanical repetition of a diagram lost the complex psychological investment that the individual diagram needed" with reference mostly to the "political context of housing need, slum replacement, and post-war rebuilding".

³⁵ E.H. Gombrich, *Art and Illusion*, 151.

creativity. Therefore, in summary, this study underlines designers' dependence on their inheritance from previous generations (in the establishment of schemata through the analysis of precedents) and submits the mediating role of diagrams as mnemonic tools (between what is already existing and what is to be designed), while acknowledging the need to acquire the knowledge and ability to articulate and transform what has been received from history and tradition to prevent mere historicist repetition and mechanical reproduction.

1.5. Object

The objects of the comparative analysis this study presents are Le Corbusier's Villa Savoye and Rem Koolhaas' House at Bordeaux. The initial idea for such a comparison is borrowed from Anthony Vidler, who claims that "Rowe's version of the diagrams of Le Corbusier's villas at Poissy and Garches themselves become the canonical references for late modernist space, referred to by architects as diverse as Rem Koolhaas, in, for example, his own mutation of the twentieth-century villa in the recently completed House at Bordeaux".³⁶ There are several reasons for the contention that Vidler's suggestion of a comparison between the two buildings is worth scrutiny. First of all, both architects are among the avant-garde of their respective generations and well-known for their iconoclasm and their work can be observed through massive publication. Second, both buildings stand as cornerstones in the history of architecture as products of the avant-garde stances of their designers, propagating theoretical and aesthetic discussions while serving as the model for several reproductions. Third, although a general consensus can be achieved about the innovative qualities of both buildings which can be discriminated as unique works of architecture, their evolution can be

³⁶ Anthony Vidler, *Histories of the Immediate Present*, 193.

observed with reference to a set of precedents, an asset which suits the scope of the study at stake. Villa Savoye can be viewed as an emblem for Le Corbusier's 'five points of a new architecture' as well as 'the architectural promenade' that are embodied in and anticipated by the Domino diagram of 1914, which gave birth to a series of interpretations toward its perfection and culmination by the end of 1920s in the Savoye building. Built in mid-1990s, the House at Bordeaux on the other hand, emerges as the transformed and mutated version of modernist precedents, especially Le Corbusier's Savoye and displays a rich array of apparent as well as subtle clues on its designer's practice. Its value has been acknowledged by the Pritzker Jury of 2000 who claimed that "had he only done the Bordeaux project", Koolhaas' "niche in the history of architecture would have been secure".³⁷

Although his work denies an easy classification, Koolhaas' name is repeatedly mentioned in contemporary architectural literature for his references to modernist work³⁸ and in relation to 'diagram architecture' or 'diagrammatic practice'.³⁹ In contrast to most of the proponents of the so-called diagram architecture, Koolhaas' architecture seems to be more in tune with the repetitive quality of the architectural diagrams and the inheritance from previous generations. However, his architecture is easily differentiated from historicist repetition, because although he employs references to modernist precedents, he works against the grain by constantly questioning the established traditions and canons to subject

³⁷ [INTERNET, WWW] ADDRESS: <http://www.pritzkerprize.com/143/mono2000/Koolhaasmon.pdf> [last accessed June 2007]

³⁸ Jeffrey Kipnis, "Recent Koolhaas," *El Croquis* 79 (1996): 28. Kipnis claims that most of Koolhaas' works appear as coherent syntheses but not collages "of several well-known Modern precedents". He asserts that there are references to Villa Savoye, Farnsworth House and Johnson's Glass House in Villa Dall'Ava, Le Corbusier's student housing in Nexus World, Mies' National Gallery in Kunsthall and Agadir. Koolhaas himself admits that especially his early work relied on modernist precedents. See Alejandro Zaera Polo, "Finding Freedoms: Conversations with Rem Koolhaas," *El Croquis* 53 (1992): 6-31.

³⁹ For instance in R.E. Somol's "Dummy Text" and in Vidler's "Diagrams of Diagrams" as well as *Histories of the Immediate Present*.

them to endless transformation and mutation. His graduation project at AA, London, is a critical view of modernism (as well as the role of architecture in politics) in which he takes the Berlin Wall, duplicates it to divide London with a sterile strip of buildings to inhabit the “voluntary prisoners of architecture”.⁴⁰ Similarly, *Delirious New York* takes issue with the metropolitan grid, the typical plan of the skyscraper and the elevator. His more recent library projects in Paris (Tres Grandee Bibliotheque of 1989 and Jussieu Library of 1993) can be seen as interpretations of the Domino diagram.⁴¹ In projects like these, the architect values the diagram both as a generative architectural tool, and a metaphorical device to address the contemporary socio-political issues, an attitude deemed necessary by critics such as Somol and Vidler.⁴²

It is possible to claim that both Savoye and Bordeaux houses are built diagrams. In other words, they say less about form and shelter than they say about ideas. This is not to suggest that other buildings are devoid of concepts, contrarily, by nature, any building can be seen as the crystallization of an idea. However, it must be noted that very few buildings provide such richness in discourse and in conceptual elaboration while preparing the ground for a shift in paradigm, in a field where such shifts are seldom seen.

⁴⁰ See “Exodus, or the Voluntary Prisoners of Architecture” in *S,M,L,XL*, 2-21.

⁴¹ From a structural point of view, by nature, any reinforced concrete building can be seen as an interpretation of the Domino diagram. However, there is more in these buildings (and also in Maison Dom-ino) than structure that maintain a dialogue with Corbusian themes. In Grand Library elevator shafts become the pilotis that bear the load of the layers which are carved out to form the blobby public spaces. (Koolhaas calls it the strategy of the void.) In Jussieu the layers are warped and combined so as to allow an uninterrupted circulation throughout the building. Both buildings challenge and question the static nature of quiet library stacks via programmatic innovation and structural experimentation.

⁴² R.E. Somol, “Dummy Text”; Anthony Vidler, “Diagrams of Utopia,” *Daidalos* 74 (2000): 6-13.

1.6. Methodology

This study stems from an examination as well as a criticism of the contemporary architectural production mostly observed in relation to the genre 'diagram architecture' or 'diagrammatic practice'. By addressing the bipolar nature of diagrams, it relies on the proposition that diagrams act as mnemonic tools that promote establishment of schemata, retrieval and repetition in a counter argument to the embracement of the diagram as an antidote to precedence. However, this repetition is in distinction from historicist revival, and the need to adopt or develop design techniques to transform what has been received from tradition is underlined. The related literature review sets the background for the comparison, while also providing additional support for the arguments of the study on precedence. The main model of this study is comparative analysis, exemplified by Colin Rowe's "Mathematics of the Ideal Villa" in which he compares Palladio's Villa Malcontenta to Le Corbusier's Villa Stein. The significance of such analysis lies in the fact that without necessarily referring to physical appearance (and thus avoiding stylistic issues), it renders underlying universal principles (such as geometry, figure-ground relations, rhythm, proportion) visible, especially with the help of diagrams. This is how Rowe managed to deny a *tabula rasa* condition in architectural design, by showing that under the surface, even two buildings that are distant in time, geography and physical appearance possess some universal qualities. This study adopts Rowe's perspective and adapts his model by blending analysis with comparative reading. Therefore, rather than linking the two buildings formally and searching for clues of likeness, the comparison is devised to initiate a dialogue which may allow to achieve a better understanding of the possibilities about how ideas (therefore diagrams) are shared between buildings and designers. Focusing on ideas and concepts rather than formal composition and representation requires a diagrammatic approach, which may involve operating on diagrams but does not necessarily confine itself to the limits

of drawing. The comparative reading is a reconstruction based on facts, documents and opinions examined in the course of research and such a reconstruction is aimed at establishing a framework towards understanding the nature of the relationship between architectural precedents and diagrams.

1.7. Content

The following chapter titled “Architectural Diagrams, Diagram Architectures and Precedents” aims at extending the literature review while acting as a bridge between the theoretical framework and the main study of the thesis. It starts with a review of architectural diagrams as drawing tools and proceeds to display the shifts in the architectural discourse of the diagrams in an effort to understand how diagrams are received and interpreted in the contemporary discussions. Following an examination on the relation between precedents and diagrams, diagram’s embracement as an antidote to precedence is discussed. Colin Rowe’s “Mathematics of the Ideal Villa” both provides the model for and the transition from the conceptual framework to the comparative analysis of the study.

The third chapter presents the main study of the thesis. It departs from Le Corbusier’s analysis on his own building and discusses the link between his work and that of Koolhaas. The comparison starts with the descriptions of the buildings and their sites and develops through examinations on the conceptual, structural, formal, spatial and symbolical formulations of both designers.

A final chapter discusses the necessity of viewing diagrams’ role as mnemonic tools in relation to the architects’ schemata and to the understanding of drawing as a form of thinking.

CHAPTER 2

ARCHITECTURAL DIAGRAMS, DIAGRAM ARCHITECTURES AND PRECEDENTS

Until very recently, in architectural contexts the term *diagrammatic* could well be a source for embarrassment when referred to a design proposal or a building. It would mean that the design under focus is dry, free of emotion, devoid of or lacking elaboration in formal qualities, underdeveloped or unfinished at its best. It is due to the heavy baggage of negative connotations that the word diagram usually carries around that contains terms such as reduction, schematism, and absence of emotion or aura.⁴³ This reputation is in contrast with the wide array of its implications in the architectural design procedures, from the functionalist bubble diagrams to circulation or flow charts, from planning sketches to finely drafted equipment or furniture layouts and from studies in the early phases of design to the final presentation or construction drawings. This is understandable as far as it is considered that both in professional and pedagogical contexts, the final product traditionally appears as the object of appraisal, keeping both the built form and its proper representation in the form of fully rendered drawings or beautifully shot photographs at the centre of focus. It is possible to claim that the diagrams, metaphorically, are 'the working class of architectural representation': they are over-employed, under-paid and kept out of sight at the periphery.

⁴³ Anthony Vidler, "Diagrams of Utopia". Vidler opens his discussion by mentioning the negative connotations of architectural diagrams.

2.1. Diagram as Drawing

It should not be surprising then, to discover that descriptions of diagrams as tools of drawing find relatively small space in architectural literature. Among the few who wrote on architectural diagrams, one can count Paul Laseau⁴⁴, Francis D.K. Ching⁴⁵, Ron Kasprisin and James Pettinari⁴⁶, Robert I. Duncan⁴⁷, Donald E. Hepler and Paul I. Wallach⁴⁸, Iain Fraser and Rod Henmi⁴⁹, and Bryan Lawson.⁵⁰

While most authors spare sections in their work for diagrams in varying length and detailing, Laseau almost exclusively dwells on diagrams in two separate books and his effort seems to be to establish diagramming as “a graphic language that consists of grammatical rules and vocabulary”. So rather than focusing on a differentiation of diagram types, he emphasizes their integrity “as a language that must have the elements of consistency, clarity, and identity, which are required for any successful communication”.⁵¹ He echoes diagrams’ abstractive power that renders complex relations and entities visible, shifting emphasis from “their own physical form” to “what they represent”.⁵²

Ching emphasizes diagrams’ ability to assist inference and reasoning by simplifying complex entities through “a process of elimination and

⁴⁴ Paul Laseau, *Graphic Problem Solving for Architects and Designers* (New York: Van Nostrand Reinhold, 1986) and *Graphic Thinking for Architects and Designers* (New York: Van Nostrand Reinhold, 1988).

⁴⁵ Francis D.K. Ching, *Design Drawing* (New York: Van Nostrand Reinhold, 1998).

⁴⁶ Ron Kasprisin and James Pettinari, *Visual Thinking for Architects and Designers* (New York: Van Nostrand Reinhold, 1995).

⁴⁷ Robert Duncan, *Architectural Graphics and Communication* (Dubuque: Kendall/Hunt, 1980).

⁴⁸ Donald E. Hepler and Paul I. Wallach, *Architecture: Drafting and Design* (Lake Forest: MacMillan/McGraw-Hill, 1987).

⁴⁹ Iain Fraser and Rod Henmi, *Envisioning Architecture: an Analysis of Drawing* (New York: Van Nostrand Reinhold, 1994).

⁵⁰ Bryan Lawson, *How Designer’s Think: The Design Process Demystified* (Oxford: Architectural Press, 1997[1980]).

⁵¹ Paul Laseau, *Graphic Problem Solving for Architects and Designers*, 25.

⁵² Ibid.

reduction". He also emphasizes their abstract nature and roughness, as a necessity to prevent early fixation on certain ideas and to stimulate the investigation of further possibilities and alternatives. In his opinion, diagrams are helpful both in understanding a specific problem (by revealing the "essential nature of program elements") and solving it (by looking for "ways in which these elements can be organized to make a unified whole").⁵³ Ching also provides us with a classification of diagrams, which brings together various types of drawing at varying scales and sizes. Possibly aware of the confusion this variety may cause, Ching reminds us in passing, that "we can use any of the drawing systems to define the viewpoint of a diagram". According to him, especially at the early stages of design when dealing with relatively simpler issues, "a two-dimensional format is usually sufficient". As the attributes of the design gets more complex however, "a three-dimensional drawing system becomes necessary", of which "cutaway, expanded and phantom views" are exemplars.⁵⁴

Kasprisin and Pettinari elaborate Ching's dual division of possible drawing systems to be used in diagramming one step further by dividing three-dimensional systems into two as perspective and paraline drawings.⁵⁵ They define the diagram as "a graphic that explains the outline of parts and their workings and relationships", which can vary on an array of "real, semi-abstract or abstract" expression.⁵⁶ Since they think diagrams represent "the essence of a design", the act of diagramming is "a method that assists in distinguishing *things* from *form*".⁵⁷ Contrary to the pedagogical aura of Ching's description, Kasprisin and Pettinari's is much more professionally oriented, with many examples of large-scale, real-life projects.

⁵³ Francis D.K. Ching, *Design Drawing*, 289.

⁵⁴ *Ibid.*, 291.

⁵⁵ Ron Kasprisin and James Pettinari, *Visual Thinking for Architects and Designers*.

⁵⁶ *Ibid.*, 32.

⁵⁷ *Ibid.*, 35.

Duncan's book is a naïve combination of Ching and Laseau's work, in that it reserves a separate chapter under the heading 'diagramming' and displays a brief collection of the elements of diagramming language, as well as a concise description followed by a few examples.⁵⁸ He simply refers to all sorts of drawings preceding the finished design as diagrams that "allow us to think in visual terms".⁵⁹ Duncan mentions the importance of diagrams in the translation of relevant "supportive data" into architectural context, as well as their rough and incomplete nature that is stimulating for communicable interpretation and exploration.⁶⁰

Hepler and Wallach almost eschew diagrams, mentioning them only in passing and judging them by the "inexpensive tracing paper" they are drawn on.⁶¹ They also picture design as a linear progression, in which freehand sketches are used to map, sort and analyze 'user elements' until the achievement of a particular "sketch that provides in the best way possible the ideal relationship between these elements" to be called as an "idealized diagram".⁶² The findings of the idealized diagram and user analysis are fused through the "site-related diagram", that is basically a kind of "fitting" activity to be followed by the form generating activities of the designer.

Fraser and Henmi define diagrams as drawings "which engage in a self-conscious reductive process, attempting to make clear a specific interpretation through exclusion".⁶³ They emphasize the difficulty in discriminating a drawing as a diagram and employ examples to

⁵⁸ Robert Duncan, *Architectural Graphics and Communication*.

⁵⁹ *Ibid.*, 219.

⁶⁰ *Ibid.*

⁶¹ Donald E. Hepler and Paul I. Wallach, *Architecture: Drafting and Design*.

⁶² *Ibid.*, 29.

⁶³ Iain Fraser and Rod Henmi, *Envisioning Architecture: an Analysis of Drawing*, 99.

demonstrate that a drawing could be diagrammatic relative to the other drawings in comparison.

Perhaps the most cautious stance against the diagrams belongs to Bryan Lawson.⁶⁴ He spares a small section of two pages, only to remind us about the subjective qualities and possibly misleading interpretive nature of diagrams. By using the popular example of London Underground map, he seeks proof for his assertion that no other information should be inferred from diagrams than relationships. In Lawson's opinion "often only the person who has drawn the diagram knows its rules and can read it reliably". Therefore, he concludes, "designers and student designers should take great care to explain the rules of any diagrams they show to others".⁶⁵

This cautious stance is understandable to a degree that diagrams are not as much precise as construction and design drawings. Thus, one should be aware of what to deduct and infer from a diagram. There are design studies which seem to relieve some of these concerns. Ellen Yi-Luen Do for instance, in a design protocol study, asked sixty-two architecture students to work with diagrams and stories from the case based design aid *Archie*.⁶⁶ Two of her findings were that "participants used only a small set of basic geometric shapes" and they "interpreted other designers' architectural diagrams and texts in a similar way".⁶⁷ In a more recent doctoral study Fehmi Doğan interprets the drawings, namely diagrams of three expert architects, two of which are deceased.⁶⁸ He does that with

⁶⁴ Bryan Lawson, *How Designer's Think: The Design Process Demystified*.

⁶⁵ *Ibid.*, 252.

⁶⁶ Ellen Yi-Luen Do, "What's in a Diagram that a Computer Should Understand?", CAAD Futures '95, *The Global Design Studio*, Tan and Tech (eds.), National University of Singapore, 469-482.

⁶⁷ *Ibid.*

⁶⁸ Fehmi Doğan, *The Role of Conceptual Diagrams in the Architectural Design Process* (PhD. Dissertation, Georgia Institute of Technology, 2003). Although there are alternative views on designers' behaviours in early phases of design, Doğan is content to find that they mostly "agree

significant effort through archival research, interviews with people involved in the case and assessment of printed documents to draw some conclusions about the double referentiality of conceptual diagrams. He treats diagrams as empirical entities and proposes a research methodology to be used in interpreting and inferring from other designers' diagrams.

The fact that any drawing, by nature, is an abstraction to a degree and therefore is a diagram, makes the task of defining and classifying diagrams complicated. In most instances, as the review above suggests, diagrams become highly customized and personalized, and so do their definitions and implications. If any technique or type of drawing (and even models) can be used to construct a diagram, how can one distinguish a drawing (or a model) as a diagram among a set of similar representations? The most important criterion for such discrimination seems to be the level of abstraction. What separates for instance, a plan diagram from a floor plan, or, a conceptual diagram from a design sketch, then, is the level of abstraction involved and avoidance of formal representation of physical appearance. While the former reveals hints about the inner structure of spatial components, their relations, adjacencies, relative sizes and the forces acting on them, the latter provides exact information about form, location, size, furnishing and even construction techniques and materials. However, it is not easy to draw the line where a drawing ceases to be a diagram to become a precise architectural drawing, or vice versa. Thus, one of two similar types of drawings can be called to be more diagrammatic only in relation to the other.

on the dual nature of exploration in design”, namely problem structuring (problem definition space) and solution (solution space). Through three case studies, Doğan displays how conceptual diagrams mediate between these two spaces to align their corresponding structures.

2.2. Diagram as Absence

The contemporary discussions around the idea of diagrams add more complexity to the task of defining and classifying architectural diagrams. According to these arguments that largely dwell on the provocative and generative qualities of diagrams, the diagram belongs more to the world of the virtual rather than the real that is celebrated for its capacity to operate between *form* (practice) and *word* (theory) and to act as a medium for the conversion of knowledge into architectural language.⁶⁹ Thus, in the works of those who are the protagonists of the so-called diagram architecture or diagrammatic practice, the word diagram has come to represent some kind of a non-being or absence. Stan Allen calls them *stealth diagrams*, for instance, and describes the diagrammatic practice as extending “the horizontal, affiliative character of the diagram directly into the field of construction itself, engendering an architecture of minimal means and maximal effects”, finding its example in the slogan of the IBM company: “You won’t see us but you will see what we do”.⁷⁰ Somol, on the other hand, finds the disappearance of the diagram necessary for opening up new territories for practice. He reminds that a diagrammatic practice should not “be confused with simply working with diagrams”, and to be able to differentiate the naïve extensions to this practice, architecture must be understood “as a field of cultural-political plasticity”.⁷¹

Largely building on this character of diagrams as tools oscillating between the real and the virtual, the utopias of the Enlightenment employed diagrammatic expressions as formal language.⁷² “All utopias are, of necessity, diagrammatic” writes Anthony Vidler and sees the

⁶⁹ Especially see the collection of writings in *Any* 23, (1998).

⁷⁰ Stan Allen, “Diagrams Matter” *Any* 23 (1998): 16.

⁷¹ R. E. Somol, “Dummy Text, or the Diagrammatic Basis of Contemporary Architecture”, 23-24.

⁷² For the relation between the utopia and the diagram, see Anthony Vidler, “Diagrams of Utopia,” *Daidalos* 74 (2000): 6-13.

phenomenon –a legal philosopher like Jeremy Bentham drawing plans for the ideal prison, for instance– as an extension of the Enlightenment as part of the *zeitgeist* of the eighteenth century, in which the main motive was progress.⁷³ According to Vidler, diagrams were essential in the construction of ‘good place’:

It was in this form a design technique for the invention of what the 18th century was pleased to call spatial ‘machines’-‘machines for curing’ or hospitals; ‘machines’ for punishment or reform-prisons or schools; ‘engines’ of community or communes- and so on. Diagrams were essential in this process; at once the determined spatial relations of new functional needs and the calculated speculations of the new building machines, they could be, and more often than not were, invented not by the architects but by the host of new professionals-doctors drew diagrams for hospitals, legal philosophers like Jeremy Bentham drew plans for prisons, social ‘scientists’ diagrammed communities.⁷⁴

Michel Foucault, on the other hand, reads Bentham’s panopticon as “a generalizable model of functioning; a way of defining power relations in terms of everyday life of men”.⁷⁵ Rather than a machine fulfilling the requirements of the ideals of the Enlightenment, the panopticon reveals the essence of the power relations of the modern society:

But the Panopticon must not be understood as a dream building: it is the diagram of a mechanism of power reduced to its ideal form; its functioning, abstracted from any obstacle, resistance or friction, must be represented as a pure architectural and optical system: it is in fact a political technology that may and must be detached from any specific use.⁷⁶

Robert E. Somol, reflecting on the recent architectural production by Rem Koolhaas and Peter Eisenman, pairs Foucault with Gilles Deleuze and asserts that their discussions on “panopticism” as a diagram, replaces the

⁷³ Ibid., 9.

⁷⁴ Ibid., 9.

⁷⁵ Michel Foucault, *Discipline and Punish: The Birth of the Prison* (London: Penguin, 1991[1977]), 205.

⁷⁶ Ibid.

role of *the nine-square*, a well-known pedagogical tool introduced in 1957.⁷⁷ For him “the importance of the lesson of panopticism is not simply to appropriate that figure as the new organizational system, but generally to understand (and configure) society as a plastic entity, susceptible to multiple (virtual) diagrams and possibilities for arrangement”.⁷⁸

If Somol's and Vidler's arguments were united, it would be possible to observe three main shifts in the architectural discourse of the diagrams. According to Vidler, a main shift in the discourse of architectural representation occurs in the late eighteenth century when Ledoux “developed a geometrical style of representation that informed his built work” and J.-N. L. Durand joined him with the development of a similar style of representation deploying the potential of the graph paper.⁷⁹ Especially Durand took issue with the architectural training of and the style of representation preferred by the Beaux-Arts which heavily relied on the study of precedents and in which the students were required to examine and interpret the classical elements by using established tools in the form of *esquisse*, *analytique*, *composition* and *parti*.⁸⁰ In the competition system of the school, it was impossible to survive without a good command of these tools and the classical vocabulary of architecture.⁸¹ Although the developments in the representation techniques did not evolve into immediate results as their protagonists would have hoped, they were influential in “responding to the aesthetics of rationalism and the authority of functionalism” in the late nineteenth and

⁷⁷ R.E.Somol, “Dummy Text, or The Diagrammatic Basis of Contemporary Architecture”, 23. Colin Rowe was a member of the revolutionary educators' team at Austin, Texas and he participated in the collaboration toward the emergence of the nine-square problem. For the history of the educational program as well as more information about the problem see, Alexander Caragone, *The Texas Rangers: Notes from an Architectural Underground*, (Cambridge: MIT Press, 1995).

⁷⁸ R.E. Somol, “Dummy Text”, 23.

⁷⁹ Anthony Vidler, “Diagrams of Diagrams: Architectural Abstraction and Modern Representation”, 9.

⁸⁰ For a brief definition of these terms, see Hyungmin Pai, *The Portfolio and the Diagram* (Cambridge: The MIT Press, 2002), 41-42.

⁸¹ Ibid.

early twentieth century.⁸² Instead of classical orders, motifs and patterns, architectural historians and critics started to assess the architectural production through the looking glass of these abstract representation techniques, in an attempt which is referred to as 'diagramming history' by Vidler. What's more, through the practice of especially the avant-gardes, that kind of representation was directly reflected to the modernist space, visible in Mies' universal grid and Le Corbusier's abstract formal vocabulary. Rather than a passive representational element used as a tool in the transition from the ideas to built form, the abstract drawing techniques directly informed the architecture, thrusting forward geometry as the universal principle and "materializing its aesthetic and intellectual order as clearly as a mathematical formula".⁸³

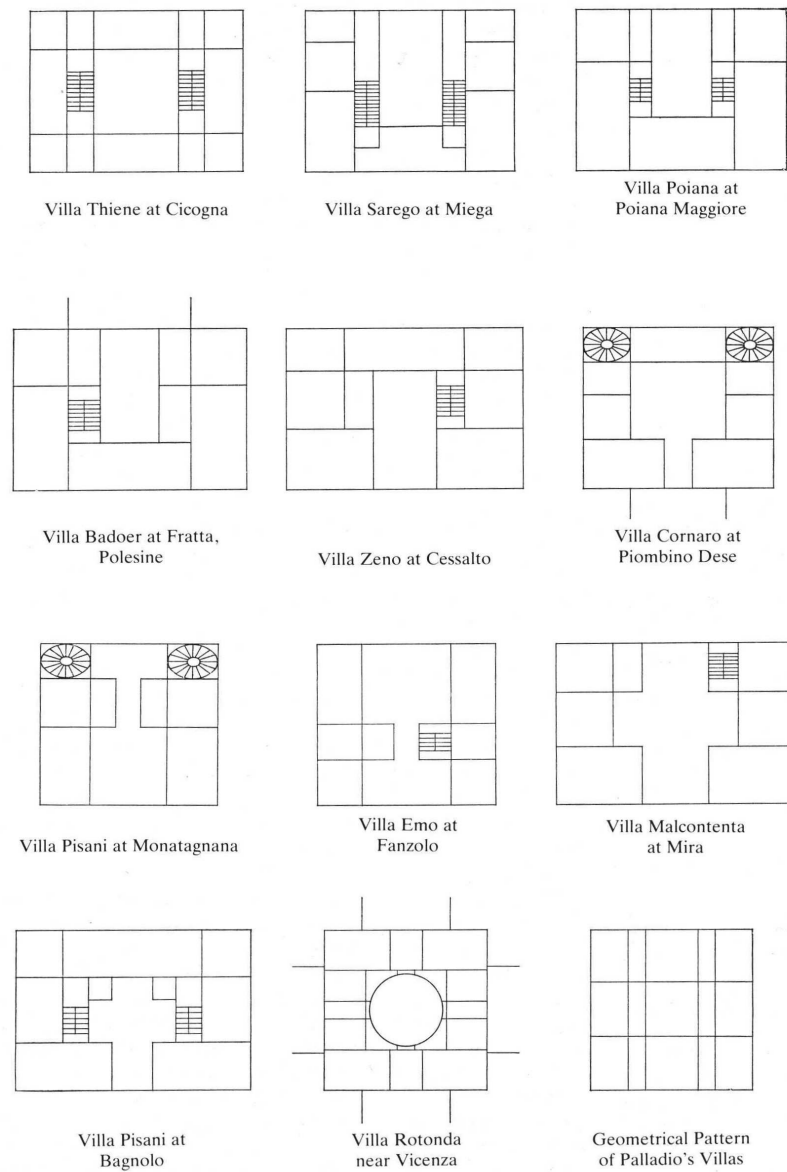
Le Corbusier is an important figure in extending this shift in the discourse of diagrams into the twentieth century, who "found in abstraction a weapon against the historical styles and a powerful support for an architecture based on form and space".⁸⁴ His early architecture provided significant material for what could be called the second shift in the history of architectural diagrams when Colin Rowe instrumentalized his work, clashing it against that of Palladio in his seminal essay "The Mathematics of the Ideal Villa". Although Rowe's essay was published two years earlier, he probably was influenced by his tutor Rudolf Wittkower and his *Architectural Principles in the Age of Humanism*.⁸⁵ Apparently the agenda central to Wittkower's analyses seems to be a different one (with many

⁸² Anthony Vidler, "Diagrams of Diagrams: Architectural Abstraction and Modern Representation", 9. Also, Pai's work examines the evolution of the discourse of the diagram in relation to the birth of reference manuals in architecture and the changing landscape of the architectural periodicals.

⁸³ Ibid. 13.

⁸⁴ Ibid., 11.

⁸⁵ Rudolf Wittkower, *Architectural Principles in the Age of Humanism* (London: Academy Editions, 1988 [1949]). Wittkower analyzed the villas of Palladio with the help of abstract diagrams and included a hypothetical twelfth one. The page illustrating the diagrams gave way to Colin Rowe's later analyses making use of diagrams.



57. Schematized plans of eleven of Palladio's Villas

6

Figure 2.1. Rudolf Wittkower, Diagrammatic analysis of Palladian Villas

(Rudolf Wittkower, *Architectural Principles in the Age of Humanism*
London: Academy Editions 1988[1940] 69)

flaws in historical actuality, according to Vidler)⁸⁶, the single page displaying the abstract diagrams of Palladio's eleven villas plus a hypothesized twelfth one presented in the form of a nine square grid, prepared the ground for a major shift in the discourse of the diagram, by providing the material for Rowe's analysis.⁸⁷ According to Vidler, Rowe's analysis demonstrated that early Corbusian architecture "represented in fact a programmatic concern for marking the distance and the relationship between modernism and tradition, between traditional space and modern space".⁸⁸ Through Rowe's analysis, Wittkower's twelfth villa established the foundation for the *nine-square problem*, which did not only serve as a starting problem for architectural education by fusing structure and space and by suggesting a language "involving a series of dialectics" (such as center and periphery, vertical and horizontal, point and plane, etc.)⁸⁹, but gave way to experimental professional work that in a way extended the questioning the relationship between the traditional and modern space. The early work of Peter Eisenman, for instance, in the form of numbered houses searching for the autonomy of the architectural form⁹⁰ was based on the cube as generic form that in some projects contained the transformations of the nine-square.

According to Somol, the nine-square which "served as the discipline's formal introduction to itself, establishing the discourse on space and structure", was replaced by panopticism as interpreted by Foucault and

⁸⁶ Anthony Vidler, *Histories of the Immediate Present: Inventing Architectural Modernism, 1930-1975*, 192.

⁸⁷ Peter Eisenman, for example, see diagram's "initial emergence in Rudolf Wittkower's use of the nine square grid in the late 1940s to describe Palladian villas. Peter Eisenman, "Diagram: An Original Scene of Writing" in *Diagram Diaries*, (London: Thames and Hudson, 1999), 27.

⁸⁸ Anthony Vidler, *Histories of the Immediate Present: Inventing Architectural Modernism, 1930-1975*, 193.

⁸⁹ R.E. Somol "Dummy Text", 12.

⁹⁰ Eisenman is the key advocate and promoter of the diagrammatic practice according to many. His early projects in the form of a series of houses involve certain operations on the nine-square grid. For his early projects see Peter Eisenman, *Houses of Cards*, (New York: Oxford University Press, 1987). Also see Peter Eisenman, *Diagram Diaries*, (London: Thames and Hudson, 1999).

Deleuze, which would be seen as the third shift.⁹¹ For Somol, the significance of these discussions lies in the fact that they show the society is open to the arranging power of possible virtual diagrams and help to “understand architecture as a discursive-material field of cultural-political plasticity”.⁹² He also suggests that such an understanding is the hall-mark of a diagrammatic practice, exemplified especially by the architecture of Eisenman and Koolhaas.

2.3. Diagram and Precedence

E.H. Gombrich's *Art and Illusion*, which he defines himself as “a study in the psychology of pictorial representation”, is an inquiry into the skepticism about the representation of reality in art (mainly painting), probably fuelled by the discussions of its time on *Gestalt* psychology.⁹³ The relevance of his work to this study is that Gombrich, especially in the chapter called “Formula and Experience”, submits the fact that the artist in his or her education needs a model or formula to work on to attain an inner gaze into the structure of things toward the representation of the world as they see it. He calls this model schema and traces its evolution from ancient art to the art of more recent times in which he encounters with diagrams in what could be called patternbooks of drawing education going back to Villard de Honnecourt's album of patterns -a search for the distribution and transmission of formula that especially accelerates after Albrecht Dürer's “experiments with the geometrical and stereometrical structure of the human body” in his *Dresden Sketchbook*.⁹⁴ Although the teaching of drawing through patternbooks feed the skepticism toward the

⁹¹ R.E. Somol, “Dummy Text”, 22.

⁹² Ibid., 24.

⁹³ E.H.Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* (Edinburgh and London: Phaidon Press, 1977, [1960]).

⁹⁴ Ibid., 135.

art object, whether it is the correct representation of what is visible or it is the application of the pattern handed down by tradition, Gombrich submits the role of schema its worth in creation of the masterly artworks. Even after the start of the struggle against the schema in eighteenth and nineteenth centuries in which the “artists turned against the academies and the traditional methods of teaching”, Gombrich finds evidences of adherence to the study of precedents.⁹⁵ One of his examples is the work of Constable who claims that when he sits “down to make a sketch from nature the first thing” he tries “to do is to forget that” he has “ever seen a picture”.⁹⁶ In contrast to the artist's declaration, Gombrich displays exercise drawings by Constable apparently based on Cozens patterns, that he thinks established the foundation for Constable's masterly depictions of landscape.⁹⁷ In Gombrich's opinion what Constable learns from Cozens by studying his plates, is not “what clouds look like, but a series of possibilities, of schemata, which should increase his awareness through visual classification”.⁹⁸ Then, what separates an artist from a mere copier of the already existing formulae that is presented to him by the tradition is the ability to receive the schemata only to “articulate and revise them beyond recognition”.⁹⁹ This is how Gombrich formulates his distinction between the medieval artist and the postmedieval master:

The hallmark of the medieval artist is the firm line that testifies to the mastery of his craft. That of the postmedieval artist is not facility, which he avoids, but constant alertness. Its symptom is the sketch, or rather the many sketches which precede the finished work and, for all the skill of hand and eye that marks the master, a constant readiness to learn, to make and match and remake till the portrayal ceases to be a secondhand formula and reflects the unique and unrepeatable experience the artist wishes to seize and hold.¹⁰⁰

⁹⁵ Ibid., 149.

⁹⁶ Ibid.

⁹⁷ Ibid., 149-152.

⁹⁸ Ibid., 151.

⁹⁹ Ibid.

¹⁰⁰ Ibid., 148.

In architectural context, Gombrich's arguments remind the architectural training of the Beaux-Arts which heavily relied on the study of precedents (through the practice of the portfolio, which would be considered basically as patternbooks) and in which the students were required to trace over formal patterns and compositions to acquire good command of classical vocabulary. Although such practice has been overthrown by the following generations, the study of precedents is still an issue in contemporary architectural practice and education.

In his "Schemata, Gambits and Precedent: Some Factors in Design Expertise", Bryan Lawson studies some factors in design expertise in which communicating and sharing experiences and understandings carry significant importance.¹⁰¹ According to Lawson, this communication heavily relies on "development of schemata" in the form of "simple diagrams, catchphrases or even words" through which "enormously complex and sophisticated ideas can be referred to".¹⁰² The development of schemata, in other words accumulation of knowledge of precedents and experience is the first step which should be accompanied by an ability to recognize certain patterns in the structure of a specific problem and to decide which schema(ta) would be useful toward the solution for the same problem.¹⁰³ Lawson does not discriminate between drawing and verbal conversation because both can be part of the schemata of the designers, however, his account of expert designers tend to slightly elevate the former above the latter, which help them to concentrate on relatively smaller territory for recognizing familiar elements:

¹⁰¹ Bryan Lawson, "Schemata, Gambits and Precedent: Some Factors in Design Expertise".

¹⁰² Ibid., 446.

¹⁰³ Ibid.

I like to see things encapsulated in one small image. We have a rule never to draw at a size larger than necessary to convey the information needed... we always use the smallest possible image.¹⁰⁴

Lawson turns to the game of chess and some cognitive studies on it¹⁰⁵, in which recognition of certain patterns by focusing on a small area is vital. From chess, he borrows the notion of gambit, which basically means a play of predetermined and pre-studied sequence of moves aimed at earning an advantage by sacrificing a piece at first. The more a chess player collects gambits and precedents in his or her repertoire, the more he or she is likely to become an expert player. Recognition of these patterns shorten or totally make redundant the analysis required for understanding the problem, which explains how chess masters can play against a large number of less experienced players in demonstration games.¹⁰⁶ Lawson finds parallels between expert chess players and designers:

Chess masters can easily defeat amateurs in such a way. However, to beat another chess master who is also recognising and similarly has a vast pool of precedents and gambits to rely on, they need to create something new, original and surprising. This sounds remarkably like what we also expect from expert designers. We expect them not just to solve problems well but to surprise us and add something new to the pool of precedent other designers rely upon.¹⁰⁷

Thus, for Lawson, to become an expert designer, one has to rely on accumulation in a considerable vast pool of precedents and gambits, develop the ability to recognize them and their guiding principles as well

¹⁰⁴ Ibid., 447. Lawson is quoting from Michael Wilford talking about their joint practice with James Stirling. He also includes preferences of some well known designers on what size to draw, such as Calatrava's habit of sketching on A5 pads.

¹⁰⁵ For instance, A. D. Groot, *Thought and Choice in Chess* (The Hague: Mouton, 1965).

¹⁰⁶ Lawson is referring to the findings of Groot's study on chess, which showed that "chess masters rarely analyzed a board situation, rather they recognized it." Also "chess masters could remember mid-game board situations much more reliably than novices. However, their comparative expertise vanished when asked to remember randomly positioned pieces that did not relate to game situations". Bryan Lawson, "Schemata, Gambits and Precedent", 448.

¹⁰⁷ Ibid.

as the ability to link them to solutions in problem situations.¹⁰⁸ To further their expertise, they are also supposed to establish their own 'repertoire of tricks' or design gambits and to set new standards for architectural production both in theory and practice.

In the context of design education, Rivka Oxman asserts that the "quantity of knowledge and information is not the most useful construct" and it would be a "naïve approach" to claim that "the more knowledge the student gains, the more design skill he will acquire".¹⁰⁹ According to Oxman, what matters is not "the quantity of knowledge gained, but knowing where to find it" and "how to use it when needed".¹¹⁰ Although at first glance, Oxman's argument seems to be negating Lawson's, when it is considered that knowing where to find the information and how to use it when needed also requires an acquisition of knowledge and ability, it is not necessarily so. Since Lawson underlines the necessity of developing the ability to recognize repeating patterns in precedents and problem situations, and also to link them to solutions, their views can be claimed to be complementing one another.

There are accounts of designers which seem to be not only supporting Lawson's arguments, but pointing at the problematic relation between the precedents and diagrams as well. The January 2006 issue of *the Architectural Review* that brings together architects who "describe the role of diagrams in their own work, and examples they admire by others" can be seen as a proof of Lawson's report that architects "find it hard to think without pencil in their hand".¹¹¹ With its power of abstraction and objectification, most of the architects see diagrams' role crucial in both

¹⁰⁸ Ibid., 456-457.

¹⁰⁹ Rivka Oxman, "Think-maps: Teaching Design Thinking in Design Education", *Design Studies*, (2003):1-29. [INTERNET, WWW], ADDRESS:<http://www.technion.ac.il/~rivkao/topics/publications/article.pdf>

¹¹⁰ Ibid.

¹¹¹ Bryan Lawson, *Design in Mind* (Boston: Butterworth Architecture, 1994), 141.

understanding the problem and offering a solution. Seen as such, diagrams serve as a refuge from pre-conceived ideas and forms and as an antidote for stylistic preferences. Since the diagram reveals the essence, many architects find it important to have a “graphic one-liner”, a noble diagram to express their ideas to themselves and others.¹¹² “If there is a diagram”, writes David Dunster, “which can be repeated to friends and colleagues, even used in a future monograph, then there is a mnemonic, something to remember, an easily repeatable set of lines”.¹¹³ Dunster’s remark about the relation of the diagram with the faculty of memory point to a dilemma: as a mnemonic device, the diagram faces the risk of being easily remembered and then repeated. The noble diagram, seen as an antidote for pre-conceived ideals and as a guarantee for authenticity carries the risk of losing power in repetition. Addressing the “political context of housing need, slum replacement, and post-war rebuilding”, for instance, Dunster reminds us that “mechanical repetition of a diagram lost the complex psychological investment that the individual diagram needed”.¹¹⁴ Klaus Herdeg’s *Decorated Diagram* of 1983 can be seen as an investigation on the issue.¹¹⁵ Herdeg’s agenda is an apparent attack on Bauhaus ideals in the form of a critique of Walter Gropius’ teaching methods at Harvard’s Graduate School of Design, holding him responsible for the production of some “ugly” buildings in the post-war period through the practices of the graduates of the program. Although the hidden agenda seems to be the fortification of the front line of post-modernism in architecture, Herdeg’s diagrammatic analysis is important in that it displays how the canonization of the ideals of Modernism paved the way to mechanical repetition, one that blocked the way to authenticity and separate handling of the facts of each individual design case.

¹¹² The verbal equivalent of a diagram in architecture is explained with an analogy to advertising by Stefan Behnisch, *Architectural Review* 1306 (2006): 32.

¹¹³ David Dunster, *Architectural Review* 1306 (2006): 29.

¹¹⁴ Ibid.

¹¹⁵ Klaus Herdeg, *The Decorated Diagram* (Cambridge: The MIT Press, 1983).

A similar dilemma originating from the nature of the diagrams, perhaps slightly in a different context, is at the heart of one of the cornerstones of the architectural history in the twentieth century. Written at a time of heightened excitement toward computerization, Christopher Alexander's *Notes on the Synthesis of Form* still enjoys receiving numerous quotations from an interdisciplinary field focusing on the idea of diagrams.¹¹⁶ In his preface to the 1971 edition of the *Notes* Alexander declares that the most outstanding feature of his book is "the idea of diagrams".¹¹⁷ However, neither is this a handbook for the making and using of architectural diagrams, nor, as Alexander states himself, a "method" book to be followed "blindly". What Alexander favors is the decomposition of the context of a certain design problem to arrive at independent constructive diagrams that "deal with systems of forces whose internal interaction is very dense, and whose interaction with the other forces in the world is very weak".¹¹⁸ These diagrams then, are fused to arrive at a single solution. Since the diagrams produced are independent but coherent, their interpretation allows achieving different but working forms that are not conflicting with the context.

Beneath the surface of the first impression (that this is a method book of [working with] diagrams), Alexander's task seems to be an attack on the (arbitrary and almost dogmatic) conventional categorization of the subproblems of a design problem which can be associated with the functionalism of the modernist tradition. Alexander thinks that designers rely heavily on traditional, pre-determined linguistic generalizations in problem formulation. He proves that even in a small-scale design problem, the combinations of the links between the elements of the subsets of the requirements reach up to enormous numbers (2 to the

¹¹⁶ Christopher Alexander, *Notes on the Synthesis of Form* (Cambridge: Harvard University Press, 1964).

¹¹⁷ Ibid. Preface, page unnumbered.

¹¹⁸ Ibid.

tenth power for a problem with 10 factors) and concepts available in the language (i.e. English) cannot match these numbers. Even when they can, this matching could be quite arbitrary.¹¹⁹ Sub-problems that cannot be clearly expressed, cannot be reflected well in the solution in turn. In addition to that, once the concepts are invented, “we lose the ability to modify them”. Thus, designers end up “caught in a net of language of their own invention”.¹²⁰

Despite the call for rationality, employment of mathematical calculations and implications of computation, the method promoted in the *Notes* does not give absolute answers after the input of the variables and design parameters. There is always room for the intuition and experience of the designer. As the worked example shows in the appendix of the *Notes*, even with the same decomposition of the same problem, one may tend to draw different diagrams or one may achieve different forms by using exactly the same diagrams, depending on one's own designing abilities and accumulation of experience. (One should submit that there are exceptions such as the motorway intersection diagram in which “the overall pattern called for emerges directly from the diagram” that Alexander refers to as a ‘constructive diagram’.)¹²¹ This is where Alexander paves the path to his further studies that embrace the idea of the *architectural precedence* such as *Pattern Language*.¹²² Since there will always be a need for intuition and personal expression in the design process, his contention is that whenever a successful decomposition of the problem is achieved, the solution will eventually evolve and fit the context well whatever the final form is or whatever diagrams are used in its formation. Unfortunately, the problems that the modern designer faces are so complicated that his own experience and intuition will fall short and

¹¹⁹ Ibid., 66.

¹²⁰ Ibid., 69.

¹²¹ Ibid., 88.

¹²² Christopher Alexander, *A Pattern Language : Towns, Buildings, Constructio*, (New York: Oxford University Press, 1977).

he will search comfort in the pre-existing solutions of the architectural precedents. This explains Alexander's return to the so-called closed system of the *Pattern Language*, by the end of the 70s.

Many architects are aware of the double-sidedness of the diagram, that it (by being a mnemonic tool) is a mediator for what the history and the tradition hand down to us, as much as it is celebrated and embraced as an antidote (by also being a mediator for the translation of data into architecture toward the solution of the contingencies) for that kind of prescription. Peter Wilson, for instance, thinks that "the prescriptive diagram is a stringently reductive design tool", and almost reminding Klaus Herdeg's attack on the repetitive quality of the Bauhaus tradition, writes that "successful buildings from the 'diagram school' are judged by their felicity to the generating hieroglyph".¹²³ Wilson also describes the double role of the diagram from the perspective of the "media-circulated new-millennia": on the one hand, the diagram "is prescriptive, proffering a sort of DNA/hieroglyph, which purports to have already solved all contingent issues". On the other hand, it "is offered to the observer/critic as a yardstick against which to measure the finished building".¹²⁴ As a second specimen, Stanley Tigerman submits the diagram its power in the initiation of an idea in graphic form, which, if strongly formulated, evolves itself almost magically toward a desired solution.¹²⁵ However, he can not refrain from reminding that "history and environment are preconceptions that weigh heavily in determining what that first diagram is".¹²⁶ John Miller joins his colleagues in the acknowledgment of the potential of the diagram against "the possibility and danger of preconception". And yet, he is content in that "a response to a brief always brings to bear pre-existing

¹²³ Peter Wilson, *Architectural Review* 1306 (2006): 45. Wilson's analogy between the diagram and the hieroglyph is made clear in the opening lines of his essay, where he reminds us that in ancient Egypt, "the hieroglyph for house was a horizontal box, the middle third of the lower side missing and below this a vertical line - a room, a door, a planometric diagram".

¹²⁴ Ibid.

¹²⁵ Stanley Tigerman, *Architectural Review* 1306 (2006): 52.

¹²⁶ Ibid.

architectural luggage, including previous experiences, intuition and a preference for particular formal arrangements".¹²⁷

2.4. Diagram Architecture: Antidote for Precedence?

Toyo Ito, who seems to be the first to put the name tag 'diagram architecture' on to the genre, finds refuge in the architecture of Kazuyo Sejima (and therefore as a mentor and compatriot, in his own) from the burden of the forms handed down by the tradition.¹²⁸ According to Ito, "the conventions of architecture" that are "better known as 'archetypes'" find their way into the architectural design procedures through 'planning'. First, there is a diagram that helps to translate functional data into the language of space. Then comes "the customary planning method", by the help of which the "spatial scheme is transformed into architectural symbols". Finally there is the three dimensional conversion that is largely dominated by the architect's longing for self-expression, in which preconceptions play an important role.¹²⁹ After exposing the channel through which predetermined solutions leak into the design process, Ito announces the significance of Sejima's architecture and her ability to avoid what is handed down onto her as tradition. For him, this is possible with the eradication of planning from design process:

The freshness of Kazuyo Sejima's architecture lies in the fact that these contradictory, complicated processes are dealt with in the utmost brevity. She arranges the functional conditions which the building is expected to hold, in a final diagram of the space, then she immediately converts that scheme into reality. Which is why the habitual process known as planning is largely non-existent in her work. In her case, the architectural convention

¹²⁷ John Miller, *Architectural Review* 1306 (2006): 58.

¹²⁸ Toyo Ito, "Diagram Architecture," *El Croquis* 77(1) (1996): 18.

¹²⁹ *Ibid.*, 19.

that we ourselves call planning rests solely on the diagram of the space.¹³⁰

Stan Allen, on the other hand, finds significance in Sejima's architecture for her stripping down the buildings to their diagrammatic essence.¹³¹ Drawing on the transformational qualities of the diagrams rather than the representational, Stan Allen locates the diagrammatic practice between the virtual and real, foregrounding "architecture's transactional character".¹³² In these transactional operations, the diagram is seen as the channel through which architecture is connected to its outside. In other words, the diagram acts as the agent of graphic conversion of information and plays a crucial role "since nothing can enter into architecture without having been first converted into graphic form".¹³³ Making use of the media theorist Friedrich Kittler's differentiation to overcome the subjective overtones of the act of translation, Allen adopts the term transposition that he employs to describe the work of Sejima, Ito, OMA and MVRDV.¹³⁴ Allen phrases the difference between translation and transposition as follows:

In operations of transposition, conversions from one sign system to another are performed mechanically, on the basis of part-to-part relationships without regard for the whole. In the same way, diagrams are not 'decoded' according to universal conventions, rather the internal relationships are transposed, moved part by part from the graphic to the material or spatial, by means of operations that are always partial, arbitrary and incomplete. The impersonal character of these transpositions shifts attention away from the ambiguous, personal poetics of translation and its associations with the weighty institutions of literature, language and hermeneutics.¹³⁵

¹³⁰ Ibid., 20.

¹³¹ Stan Allen, "Diagrams Matter," *Any* 23 (1988): 18.

¹³² Ibid., 17.

¹³³ Ibid., 17.

¹³⁴ Ibid., 17-18. Allen is referring to Friedrich A. Kittler, *Discourse Networks, 1800/1900*, trans. Michael Metteer and Chris Cullens (Stanford: Stanford University Press, 1992).

¹³⁵ Stan Allen, "Diagrams Matter", 17.

Thus, according to Allen, the process of conversion in Sejima's architecture is best described by the act of transposition rather than translation. The absence, or rather minimization of personal expression results in an architecture that might be described as dull and dry, however, in Allen's opinion, this is the way with which diagram architecture can deal with the complex realities of contemporary living. Setting aside the burden of social institutions disguised as functionalist dogmas and the search for self-expression, diagram architecture faces those complexities in a much more straightforward manner. This attitude necessitates an establishment of "a loose fit of program and form, a directed field within which multiple activities unfold, channeled but not constrained by the architectural envelope".¹³⁶

Sejima is not alone in her search for new form that tries to escape preconception, because the rubric 'diagram architecture' includes "other applications of diagrams that accomplish... the separation of functional definition from formal solution, thereby creating a space where more extensive 'design movements' are possible".¹³⁷ These 'design movements' assign a new role to computer generated diagrams as an antidote for cultural blocks to production of new form and "[h]ere, diagrams appear as experimental tools, employed in the design concept as 'abstract machines'" that are "apparently without function in the context of an architectural design", such as the "Lorenz Attractor or the visualization of protein molecules".¹³⁸ By this way the computer becomes, in Birger Sevaldson's words "the engine for the production of the unanticipated" and "the designer's attention is moved from production to preparation and post production".¹³⁹ Vidler calls our attention to the inadequacy of the definition *computer aided design*, because advanced

¹³⁶ Ibid., 18.

¹³⁷ Christian Kühn, "Diagrams Are Forever: Christopher Alexander's *Pattern Language* and Notes on the *Synthesis of Form*," *Daidalos* 69/70 (1998/99): 136.

¹³⁸ Ibid.

¹³⁹ Birger Sevaldson, "Dynamic Generative Diagrams", eCAADe, (Weimar:2000).

animation, morphing and three-dimensional scanning and milling technologies has made it possible for “an architecture itself not simply aided, but generated, by digital means”.¹⁴⁰ He mentions as many different names as Frank Gehry, Ben van Berkel and Caroline Bos, Winy Maas of MVRDV, Hanı Raschid, Greg Lynn and Karl Chu among those whose recent projects are representatives of this new digitalization trend:

In projects like these, the translation of geometry into building is the more direct as a result of the intimate relations between digital representation and industrial production, so that, for example, all traditional ideas of standardization can be jettisoned by a cutting or milling factory that runs automatically from the designer’s program, as was the case with the titanium panels, all of different dimensions, that surface the vaults of Bilbao. The digital effect of these schemes is further reinforced by the use of materials with smooth reflective or translucent surfaces, and complex structures before only imagined in Expressionist or Constructivist utopias.¹⁴¹

The attempts to overcome tradition and preconception through the channel of diagrams rest on a dilemma, which is twofold in origin. First, the tendency to celebrate the diagram as “an escape from the trappings of representation” neglects the fact that “architecture nevertheless operates in a representational field”.¹⁴² And second, to overcome the shortcomings of representation, diagrams are thrust forward, which are basically by definition also representational tools.¹⁴³ To erase the negative effects of this dilemma, the proponents of diagram architecture tend to blur the definition of the word ‘diagram’, in which anything can come to be one, from the Klein Bottle to the Mobius Strip, from a frame of animation to dance notation. This blurring results in many inconsistencies in their

¹⁴⁰ Anthony Vidler, *Histories of the Immediate Present: Inventing Architectural Modernism, 1930-1975*, 182.

¹⁴¹ Ibid., 182-3.

¹⁴² Pia Ednie-Brown, “The Texture of Diagrams: Reasonings on Greg Lynn and Francis Bacon,” *Daidalos* 74 (2000): 72.

¹⁴³ Hyung-min Pai, *The Portfolio and The Diagram*, 287.

architecture and in a conclusion that their “blobby geometry is primarily a result of an aesthetic preference”.¹⁴⁴

This criticism is not to suggest a total rejection of the computer technologies and its uses in architectural domain, but to resist, easy stylistic effects and random formal preferences they bring. As Vidler reminds us, there are “questions posed throughout by modernism but not yet satisfactorily answered, in either political or architectural terms”, such as “the housing question”, “the question of density, population explosions and land scarcity”, and “the ecological questions of resources and modes of conservation”.¹⁴⁵ While offering a concise criticism of the current digital experiments, Vidler suggests an alternative approach toward the still open questions of former modernities:

New demands, not fully posed by former modernities would include the full use of modeling techniques for assimilating, integrating and ultimately forming data of all kinds in such a way that the consequences of programmatic decisions might be measured in terms that supported and evaluated design alternatives. These alternatives would not simply appear as random choices among beautiful surfaces or shaped blobs, but as arguments in form that proposed political, social and technological interventions that implied a critique of business as usual. In sum, a new modernity would continue to address the questions of the present with the imagination of an avant-garde stance, but now with the wisdom of hindsight, and a long history of the modern on which to rely.¹⁴⁶

Thus, instead of a fetishization of computer generated images and forms in an attempt to overthrow the patrimonial heritage, perhaps one should turn to the model not for the sake of senseless historical repetition, but to sharpen one’s senses through the wisdom of what has already been tested in the accumulation of the architectural history. As Rowe contends,

¹⁴⁴ Julia von Mende and Andreas Ruby, “Hybrid Hybris,” *Daidalos* 74 (2000): 84. Mende and Ruby provide a significant account of the inconsistencies in UN Studio’s *Move* and therefore their architectural theory and practice.

¹⁴⁵ Anthony Vidler, *Histories of the Immediate Present*, 217.

¹⁴⁶ Ibid.

one should “consult the old and existing” without whose reference it is not possible to proclaim “a genuine innovation”.

2.5. Colin Rowe: Rules, Points and Precedents

Perhaps one of the most influential comparative analyses in the history of contemporary architecture is the one deployed by Colin Rowe in his “Mathematics of the Ideal Villa”, that was first published by the *Architectural Review* in 1947.¹⁴⁷ Clashing Palladio’s Villa Malcontenta against Le Corbusier’s Villa Stein at Garches, the scope of the essay seems almost impossible and easy to dismiss at first glance. Not only are both buildings distant in time and quite dissimilar in appearance, but the architect of the latter distanced himself from the burdens of the traditional load bearing wall system (and in a way from that of the history) by embracing the potential of the then new reinforced concrete frame structure. There are instances when Le Corbusier sketched the almost identical floor plans of any traditional masonry building calling it *plan paralyse*, and proudly depicted next to it a box hovering in the air on pilotis, with its floor plans (as well as the elevations) enjoying the ‘freedom’ brought by the ‘revolution’.¹⁴⁸ Although Le Corbusier does not totally reject the past and does not hide his admiration for ancient architecture as early as 1923 in *Towards a New Architecture*, the

¹⁴⁷ The essay was republished in 1987 with additional visual material and an addendum by Rowe. However, as we are reminded by Anthony Vidler, “the diagrams of the ‘modular grid’ of the plans, the first floor plans and the elevations of Villas Malcontenta and Garches are ranged vertically side by side in columnar comparison”, the effect of which was lost in the republication of the essay in *Mathematics of the Ideal Villa and Other Essays*. For a discussion of the essay and on the Mannerist Modernism of Rowe, as well as the original page layout of the 1947 print that appear as figures, see Anthony Vidler, *Histories of the Immediate Present: Inventing Architectural Modernism, 1930-1975*. For the republished version see Colin Rowe, *Mathematics of the Ideal Villa and Other Essays*, 1-27.

¹⁴⁸ Le Corbusier, *Precisions: On the Present State of Architecture and City Planning* (Cambridge: The MIT Press, 1991), 43.

historical model he turns to is not Roman but Greek in origin.¹⁴⁹ Thus, obviously aware of the dissimilarities, Rowe confesses that (at least “symbolically and in the sphere of customary beauty”) the two “buildings are in different worlds”¹⁵⁰ and he initiates his essay with a more admissible comparison between the Villa Capra-Rotonda at Vicenza and the Villa Savoye at Poissy. Both buildings display full symmetry and enjoy the idyllic landscape, of which their architects underlined in their descriptions of the sites¹⁵¹ and according to Rowe “The Savoye House and the Rotonda are both famous; but they are also, in each case, more obviously Platonic and easy to take”.¹⁵² In the 1973 addendum to the essay Rowe confesses further about the dissimilarity of the villas Malcontenta and the Stein that his criticism “is presumably Wölflinian in origin”, “which begins with approximate configurations and which then proceeds to identify differences”, the limitations of which “should be obvious”.¹⁵³

After opening the essay with the comparison of the Rotonda and the Savoye, Rowe contends that “a detailed comparison is less easy to sustain between the two houses”¹⁵⁴ and he presents his main case about the villas Malcontenta and Stein claiming that they invite “a more specific comparison”.¹⁵⁵ However, the comparable similarities can only span a small paragraph:

For, in the first case, both Garches and the Malcontenta are conceived of as single blocks; and, allowing for variations in roof treatment, it might be noticed that both are blocks of corresponding

¹⁴⁹ Le Corbusier, “Architecture: Pure Creation of the Mind”, in *Towards a New Architecture*, (London: The Architectural Press, 1987), 199-223. Le Corbusier dedicates a whole chapter for an analysis of the Parthenon.

¹⁵⁰ Rowe, “Mathematics of the Ideal Villa”, 13.

¹⁵¹ For the lyrical expressions of both architects about the sites of their buildings, Rowe refers to Isaac Ware’s *The Four Books of Palladio’s Architecture* and Le Corbusier’s *Precisions*.

¹⁵² Rowe, “Mathematics of the Ideal Villa”, 13.

¹⁵³ Rowe, “Mathematics of the Ideal Villa”, 16.

¹⁵⁴ *Ibid.*, 13.

¹⁵⁵ *Ibid.*, 3.

volume, each measuring 8 units in length, by 5,5 in breadth, by 5 in height. Then, further to this, there is a comparable bay structure to be observed. Each house exhibits (and conceals) an alternating rhythm of double and single spatial intervals; and each house, read from front to back, displays a comparable tripartite distribution of lines of support.¹⁵⁶

The following paragraph starts with the warning about the similarities of the two buildings that “it might be better to introduce an *almost*” and from that point on, the rest of the essay is based on the ‘identification of differences’. Of these differences, the most significant observation is the shift of emphasis from the horizontal plane to the vertical, in the passage from Palladio to Le Corbusier:

For in the frame building it is obviously not, as in the solid wall structure, the vertical planes which predominate. Rather it is the horizontal planes of floor and roof slabs; and, therefore, the quality of paralysis which Le Corbusier noticed in the plan of the solid wall structure is, to some extent, transferred in the frame building to the section. Perforation of floors, giving a certain vertical movement of space, is possible; but the sculptural quality of the building as carving has disappeared and there can be nothing of Palladio’s firm sectional transmutation and modeling of volume. Instead, following the predominant planes of the slabs, in the frame building extension and elaboration must occur horizontally. In other words, free plan is exchanged for free section; but the limitations of the new system are quite as exacting as those of the old; and, as though the solid wall structure has been turned on its side, with the former complexities of section and subtleties of elevation now transposed to plan, there may be here some reason for Palladio’s choice of plan and Le Corbusier’s choice of elevations as being the documents, in each case most illustrative of elementary mathematical regulation.¹⁵⁷

Despite the presence of such powerful observations, for an audience that focuses merely on the comparison and disregards the context as well as Rowe’s life-long career, probably the content of this essay is not convincing. For those who are exposed to Rowe’s work and his consistent search for balance between the past and present, between the timeless precedent and innovation, the agenda of the essay is much clearer. Thus,

¹⁵⁶ Ibid., 3-4.

¹⁵⁷ Ibid., 11-12.

D.G. Shane claims that with this essay and the following “Mannerism and Modern Architecture” of 1950, Rowe “questioned the then prevalent mythology that Modern Architecture sprang from the 19th-century engineers aesthetic and had no other roots”.¹⁵⁸ And it must be this line of thought that led some critics to believe that “Rowe was the true founder of postmodernist thinking in the field”.¹⁵⁹ Alexander Caragone, for instance, claims that Rowe questioned “the eternal verities of modern architecture as propounded by the giants of the early twentieth century”.¹⁶⁰

Although such observations may hold true to some extent, it must be noted that Rowe also opposed “the American Pop Monumentality of the Venturi-Scott Brown-Isenour team”¹⁶¹ and remained silent about the discussions on semiotics and deconstructivism in architecture. His attitude was to resist the oppressive power wherever it originated from, a humanism that was shaped by the facts that he was born in between the wars and witnessed the destructions of the Holocaust and the atomic bomb. His appreciation of the work of Palladio and promotion of Mannerism must be related to his architectural training based on “the British Neo-classical tradition, French Beaux-Arts teaching principles and English Arts and Craft detailing” at the Liverpool School of Architecture and also to his tutor Rudolf Wittkower.¹⁶² For the evidence of Rowe’s search for the balance between the already existing and the new, one does not need to dig deep into his writings. The brief letter written to the editors of The Harvard Architecture Review on their topic “Precedent and Invention” clarifies his position. He opens the letter by remarking that he

¹⁵⁸ D.G. Shane, “Colin Rowe, 1920-1999” *Journal of Architectural Education* (2000): 191.

¹⁵⁹ The quotation is attributed to Reyner Banham without proper reference in Anthony Vidler, *Inventing Modernism*, 67-68.

¹⁶⁰ Alexander Caragone is the editor of *As I was Saying*, a collection of Rowe’s writings in three volumes and also the author of *The Texas Rangers: Notes from an Architectural Underground*. This quotation is from the back cover of *As I Was Saying*, to which one’s attention is drawn by Vidler’s remark in his *Inventing Modernism*, 68.

¹⁶¹ D.G. Shane, “Colin Rowe”, 192.

¹⁶² D.G. Shane, “Colin Rowe”, 191. For a detailed discussion of the work of Rowe and Wittkower in relation to one another, see Anthony Vidler, *Inventing Modernism*, 67-110.

“can never begin to understand how it is possible to attack or to question the use of precedent” and that he is “not able to comprehend how anyone can begin to *act* (let alone to think) without resorting to precedent”.¹⁶³

After simply underlining the role of precedent in cultural constructions of language, social relations and pedagogy, he concludes with the question whether or not the “precedent and invention are the opposite sides of the same coin”.¹⁶⁴ Related with this double-sidedness, we are informed by D.G. Shane that “Rowe kept Le Corbusier’s sketch of a Janus-headed Medusa-Sun with snakes for hair” at his home. According to him, for Rowe “this symbolic presence, both smiling and crying, was a constant reminder of the ambiguity and fragmentation of the world, as well as a reflection of a sense of its inner unity”.¹⁶⁵ And according to Vidler, Rowe was not the anti-modern but “an impassioned observer of the modern in the light of the past, a believer in the irrevocable advent of modernity, and even in the existence of a modern *zeitgeist*”.¹⁶⁶

Given the fact that he has embraced the potentials of the reinforced concrete as early as 1914 with the Maison Dom-ino, and has turned his face toward the future by announcing the death of the load-bearing system and the birth of a machine aesthetic based on airplanes and ocean liners, it is not very difficult to imagine that the “Mathematics of the Ideal Villa”, which suggests roots in the past, must have put Le Corbusier in an uncomfortable position. Although there is not any record showing that Le Corbusier used the Malcontenta as a model for the design of the Villa Stein and the associations in the essay are highly speculative (but quite convincing) constructions, Rowe’s diagrammatic analysis then questioned the dogmatic break away from the past. Originally deriving its power from Wittkower’s diagramming of Palladian villas, Rowe’s diagrams

¹⁶³ Colin Rowe, “Letter to the Editors”, 188.

¹⁶⁴ Ibid., 189.

¹⁶⁵ D.G. Shane, “Colin Rowe”, 193. This sketch took its place on the cover of Rowe’s *Architecture of Good Intentions*.

¹⁶⁶ Anthony Vidler, *Histories of the Immediate Present*, 68.

denied a *tabula rasa* condition in architectural design, by showing that under the surface, even two dissimilar buildings may possess some nearly-universal qualities. To Le Corbusier's relief, Rowe is able to sustain a delicate balance between both architects and in the concluding paragraph of his essay, he submits the quality of their work when he elevates the pair above the (re)productions of their followers:

The neo-Palladian villa, at its best, became the picturesque object in the English park and Le Corbusier has become the source of innumerable pastiches and of tediously amusing exhibition techniques; but it is the magnificently realized quality of the originals which one rarely finds in the works of neo-Palladians and exponents of 'le style Corbu'. These distinctions scarcely require insistence; and no doubt it should only be sententiously suggested that, in the case of the derivative works, it is perhaps an adherence to 'rules' which has lapsed.¹⁶⁷

For Rowe, then, the threshold that separates the masterly work and its derivatives should be the attitude that is mainly shaped as an "adherence to rules". However, there is not an explicit listing of what these rules are in the "Mathematics" essay, but only implications. In the epigraph of the essay, Rowe quotes the distinction between the two causes of beauty by Christopher Wren from his *Parentalia*. As it is understood from this quotation, for Wren, natural beauty springs from geometry and is superior to customary beauty which results from repetitive encounter and familiarity. He further contends that basic geometrical figures such as the circle and the square are more beautiful than the irregular ones, and that the only beautiful positions of straight lines are the vertical and the horizontal, by reference to nature. This epigraph, combined with the inclusion of the word 'mathematics' in the title and the geometrical analyses in the text strongly hint at what Rowe's 'rules' would be. In addition to this, Rowe quotes Le Corbusier's Five Points from his *Precisions*, with which he thinks Le Corbusier "is proving a case for

¹⁶⁷ Rowe, "Mathematics", 15-16.

structure as a basis for the formal elements of design” and in this respect he is “a little more comprehensive” than Palladio.¹⁶⁸

Perhaps with the strong support of the accompanying abstract diagrams, the most convincing association between Malcontenta and Garches as observed by Rowe is the bay pattern of the structural systems. Although one needs much effort to link the first floor plans in a meaningful way in comparison, once the walls and circulation elements are cleared out to reveal the axes of the underlining structural grids, the resemblance is much clearer. There is an alternating rhythm in the horizontal bays parallel to the facades, but the bays perpendicular to the facades are arranged with exactly the same 2/1/2/1/2 or A/B/A/B/A rhythm. With Rowe’s essay in mind, when studying the design process of the Villa Stein, Tim Benton deliberately searches for the time of the emergence of this Palladian grid. However, he discovers that “some important early drawings do not have the ABABA grid at all”.¹⁶⁹ Taking into consideration the fact that Le Corbusier liked the idea to refer to the villa as ‘Les Terrasses’ and that the fluctuations during the design process in which the Palladian grid and the terraces disappear and reappear or change in shape or location, Benton concludes that it is up “to us to form a judgment as to which concerns were uppermost in the architects’ minds during the early stages of the design work”.¹⁷⁰ But still, Benton is inclined to trace the Palladian sources wherever it applies in his inquiry.

Even with the existence of such sources, the Villa Stein secures its place among highly unique works of architecture as a significant example displaying many Corbusian themes. By projecting the facades half unit from the line of supports, Le Corbusier not only does make room for his

¹⁶⁸ Ibid., 4-5.

¹⁶⁹ Tim Benton, *The Villas of Le Corbusier: 1920-1930* (New Haven and London: Yale University Press, 1987), 165.

¹⁷⁰ Ibid.

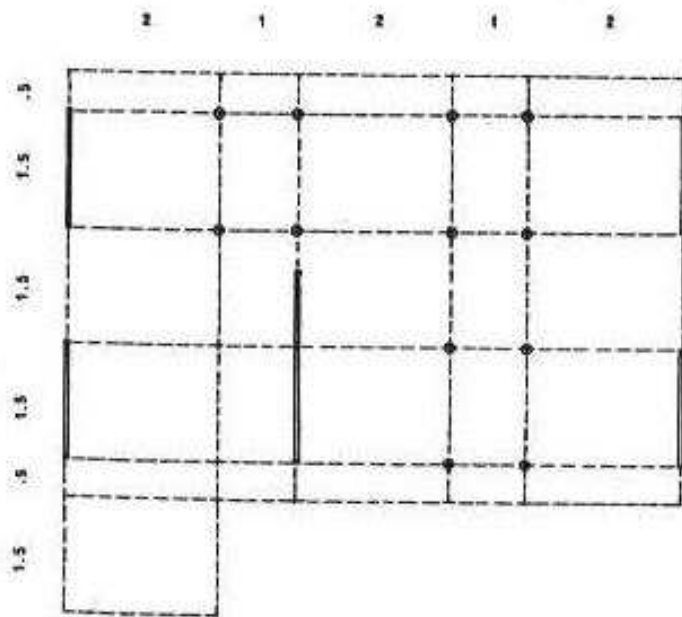
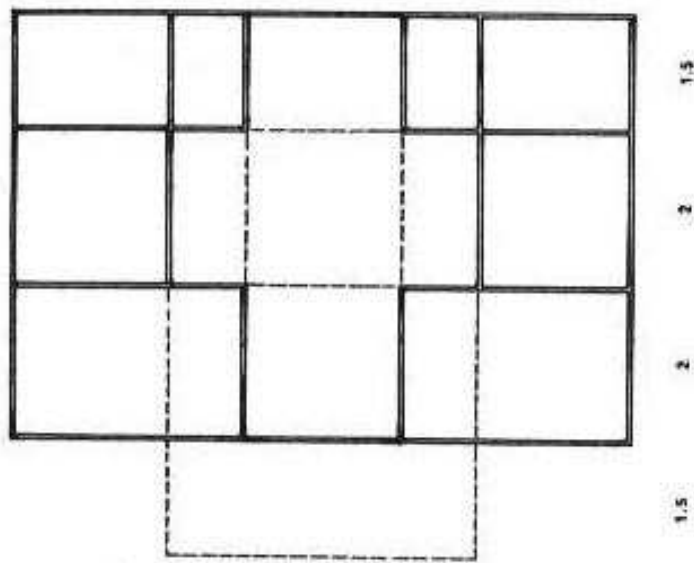


Figure 2.2. Colin Rowe, Plan diagrams of Malcontenta and Garches

(Colin Rowe, *The Mathematics of the Ideal Villa and Other Essays*,
Cambridge: The MIT Press, 1987)

facade libre, but obtain “a compression for his central bay and thereby transfers interest elsewhere; while Palladio secures a dominance for his central division”.¹⁷¹ The small balcony projecting from the roof terrace on the entrance facade hints at the symmetrical Palladian organization, but the asymmetrical arrangement of the entrance and garage doors deviate from the model. In addition, a large volume was carved out on the garden side to make room for the off-centered terrace on the first floor that erases the effect of the cross-shaped central space of Palladio. This terrace is also extruded out one and a half units providing material for Rowe’s association to the Palladian portico, which is also one and a half units in depth. However, it must be noted that when he first introduced the similarity, Rowe silently passed over the fact that Palladio’s portico naturally was placed on the entrance facade while Le Corbusier’s extruded terrace faces the garden, only to mention the latter in passing, later in the text. The idea of the automobiles circulating or ending their route on the ground floor, the *fenetres en longueur*, the roof terrace serving as solarium and gymnasium while offering analogies to the ocean-liners and machine aesthetics are clearly Corbusian concepts found in Villa Stein as well as other early domestic projects of the 1920s.

2.6. From Savoye to Bordeaux

Villa Savoye was the result of a consistent and ‘patient research’ throughout the 1920s, involving an adherence to rules as well as to repeating themes and patterns, while embodying schemata that are attained and formulated in the course of an accumulation of experiences and design experiments. Le Corbusier himself presented the villa as embodying the characteristics of the three preceding buildings that he

¹⁷¹ Colin Rowe, “Mathematics”, 4.

identified as “types”.¹⁷² However, the themes readable in the design of Villa Savoye is not limited with the three ‘types’ mentioned by Le Corbusier, but they can be traced back to much earlier work according to some historians. For instance, Tim Benton examines the work of 1920s and starts his examination as early as 1923 with Villa at Vaucresson and Atelier Ozenfant at Square Montsouris, Paris.¹⁷³ Adolf Max Vogt includes Villa Schwob at La Chaux-de-Fonds of 1916¹⁷⁴ and in an archaeological attempt, even goes further back to Le Corbusier’s childhood to reveal the schemata in the architect’s work.¹⁷⁵

Writing in 1996 that “Koolhaas’ architecture has become the most debated and influential in the world”, Jeffrey Kipnis claims that “Koolhaas is the Le Corbusier of our times”.¹⁷⁶ He also claims that most of Koolhaas’

¹⁷² Le Corbusier, *Precisions*, 134-135. In one of the 1929 Argentina lectures, he presented the villa as embodying the characteristics of the three preceding buildings that he identified as “types”, with the assistance of a sketch that presented the plans of the four buildings in a columnar fashion. The first was the Villa La Roche-Jeanneret at Auteuil, a type that he identified as showing “each organ rising up next to its neighbor”, the second was the Villa Stein at Garches that showed “the compression of organs within a rigid envelope” and the third was the Villa Baizeau in Tunisia that furnished “with a visible framework, a simple envelope, clear, transparent as a network” that allowed “the creation of useful volumes of rooms different on each floor in form and quantity”. He repeated the same analysis in his *Complete Works*, with additional axonometric sketches and notes. Le Corbusier, *Oeuvre Complete*, v.1, 189.

¹⁷³ Tim Benton, *The Villas of Le Corbusier: 1920-1930*.

¹⁷⁴ The Villa Schwob of 1916 appears stylistically different from the Le Corbusier buildings of 1920s with its brick masonry, composition of volumes and treatment of elevations; however, on the inside it hides an early experimentation with the reinforced concrete support system.

¹⁷⁵ Adolf Max Vogt, *Le Corbusier, The Noble Savage: Toward and Archaeology of Modernism* (Cambridge: The MIT Press, 1998). The main theme of Vogt’s study is to discover the schemata (mostly related to the concept of raised dwelling above ground on pilotis) and trace them in the architect’s design work. Vogt goes back to Le Corbusier’s childhood, and even further back a few generations in an almost regionalist approach to discover the impact of social and cultural formation in the French speaking region of Switzerland on Le Corbusier, where he was born and raised. *The Noble Savage* can be summed up under three topics: a phenomena Vogt refers to as the Swiss Lake-dwelling fever, Le Corbusier’s early childhood and education, and his journey to the east. One should also add to this list Vogt’s attempt to establish a connection between the thought of the architect and that of the French thinker Jean-Jacques Rousseau.

¹⁷⁶ Jeffrey Kipnis, “Recent Koolhaas”, 26. Kipnis provides a list of “standard indicators” to back up his claim: “the frequent appearance of the architect on short lists for high-profile projects; the popularity of publications by him and about his work; the number and popularity of his personal appearances; the number of student imitations; the number of Professional knock-offs, piracies, counterfeits and forgeries; the virulence of practitioners who explicitly position their work against his, and the number of practitioners, both renowned and uncelebrated, who have openly declared a debt to him”. If his list were written after 2000, it would have included the Pritzker Laureation.

works appear as coherent syntheses but not collages “of several well-known Modern precedents”.¹⁷⁷ Thus, the House at Bordeaux emerges as the transformed and mutated version of modernist precedents and displays a rich array of apparent as well as subtle clues on its designer’s practice.

¹⁷⁷ Ibid., 28. Kipnis asserts that there are references to Villa Savoye, Farnsworth House and Johnson’s Glass House in Villa Dall’Ava, Le Corbusier’s student housing in Nexus World, Mies’ National Gallery in Kunsthall and Agadir.

CHAPTER 3

A COMPARATIVE ANALYSIS OF VILLA SAVOYE AND MAISON A BORDEAUX

Descriptions

Towards the end of 1929, Le Corbusier was invited to Argentina for a series of lectures and starting with the first lecture on October 3 and finishing with the last one on October 19, he gave ten lectures which were improvised “often before different audiences”.¹⁷⁸ Villa Savoye was under construction in the summer of 1929¹⁷⁹ and in the fifth lecture titled “The Plan of the Modern House”, he presented the villa as embodying the characteristics of the three preceding buildings that he identified as “types”, with the assistance of a sketch that presented the plans of the four buildings in a columnar fashion (figure 3.1). The first was the Villa La Roche-Jeanneret at Auteuil, a type that he identified as showing “each organ rising up next to its neighbor”, the second was the Villa Stein at Garches that showed “the compression of organs within a rigid envelope”

¹⁷⁸ Le Corbusier, *Precisions*, (Cambridge: The MIT Press, 1991), x. In these lectures, he combined slide projections with his own drawings produced on stage and hung on a rope for the audience to follow the evolution of the improvised lecture. Le Corbusier explained his stage as follows: “I set up my stage: a block of a dozen big sheets of paper on which I draw in black or in color; a rope stretched across the stage behind me, on which I have the sheets hung one after the other as they are filled with drawings. Thus the audience has the complete development of my ideas facing it. Finally a screen for the hundreds of projections that materialize the preceding reasonings.

¹⁷⁹ In the fifth lecture on October 11, Le Corbusier mentions the “construction going up in Poissy”. See Le Corbusier, *Precisions*, 136. Tim Benton presents two photographs showing the building under construction during the summer of 1929, in *The Villas of Le Corbusier, 1920-1930*, 202-203.

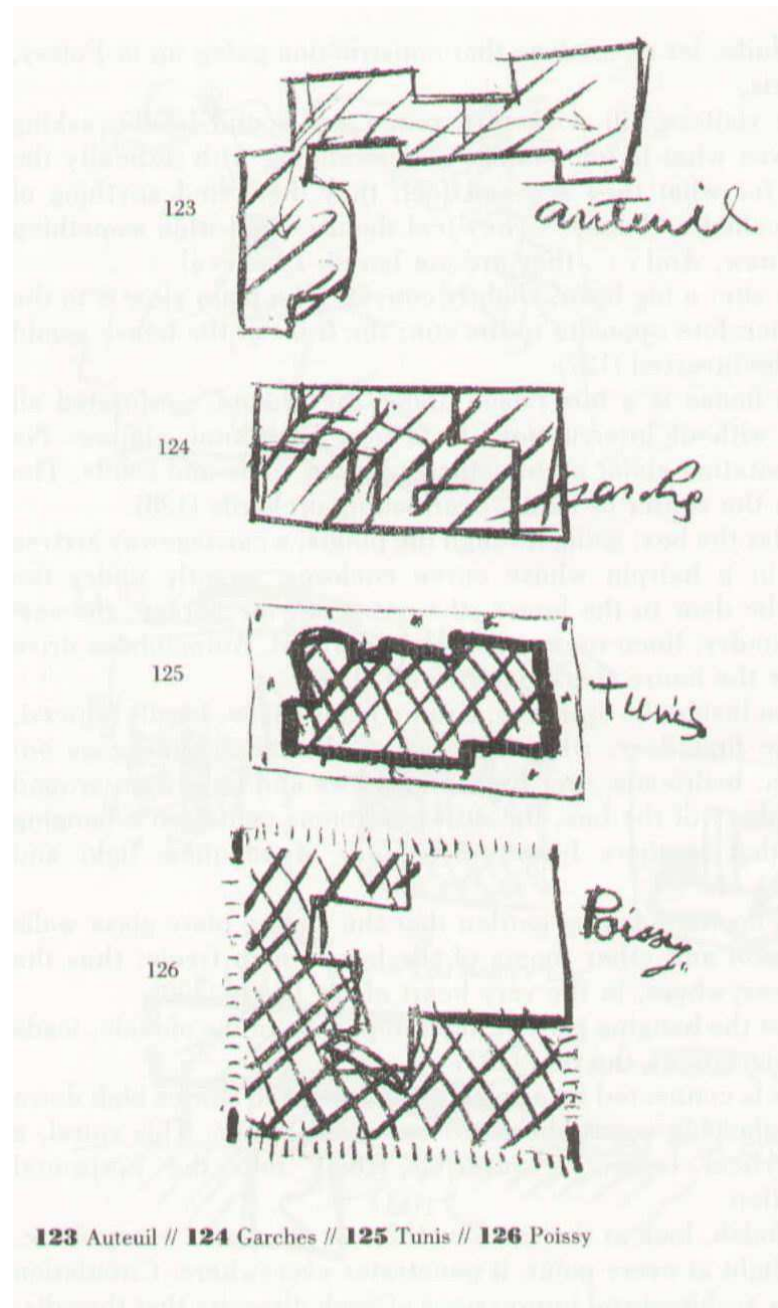


Figure 3.1. Le Corbusier, Analytical plan diagrams.
 (Le Corbusier, *Precisions*, (Cambridge: The MIT Press, 1991), 135.)

and the third was the Villa Baizeau in Tunisia that furnished “with a visible framework, a simple envelope, clear, transparent as a network” that allowed “the creation of useful volumes of rooms different on each floor in form and quantity”.¹⁸⁰

For Le Corbusier, as the fourth type, Villa Savoye attained the pure form of the second type in appearance and the planning characteristics of the first and the third. In Le Corbusier’s assessment of his own work, Villa Savoye appears as the ideal type harmoniously unifying the characteristics of the earlier three types and as the end product of a patient research involving “similar methods of classification, dimensioning, circulation, composition and proportioning”.¹⁸¹ As his ideal type, and so proud of his achievements in it, Le Corbusier reserved a privileged place for Villa Savoye in his lecture, describing it in detail (figure 3.2) and even going further in the conclusion to include a proposition of a serial production of the house as a prototype to be spread over “the beautiful Argentine countryside”:

The house is a box raised above the ground, perforated all around, without interruption, by a long horizontal window... Automobiles drive up under the house, park or drive off... From inside the entrance, a ramp leads easily, hardly noticed, up to the first floor, where the life of the inhabitants goes on... It is on the hanging garden that the sliding plate glass walls of the salon and other rooms of the house open freely... From the hanging garden, the ramp, now on the outside, leads to the solarium of the roof... To finish, look at the section: air circulates everywhere, there is light at every point, it penetrates everywhere... It is in right place in the rural landscape of Poissy. But in Biarritz, it would be magnificent... This same house, I should set it down in a corner of the beautiful Argentine countryside; we shall have twenty houses rising from the high grass of an orchard where cows continue to graze.¹⁸²

¹⁸⁰ Le Corbusier, *Precisions*, 134.

¹⁸¹ Ibid.

¹⁸² Ibid., 136-139.

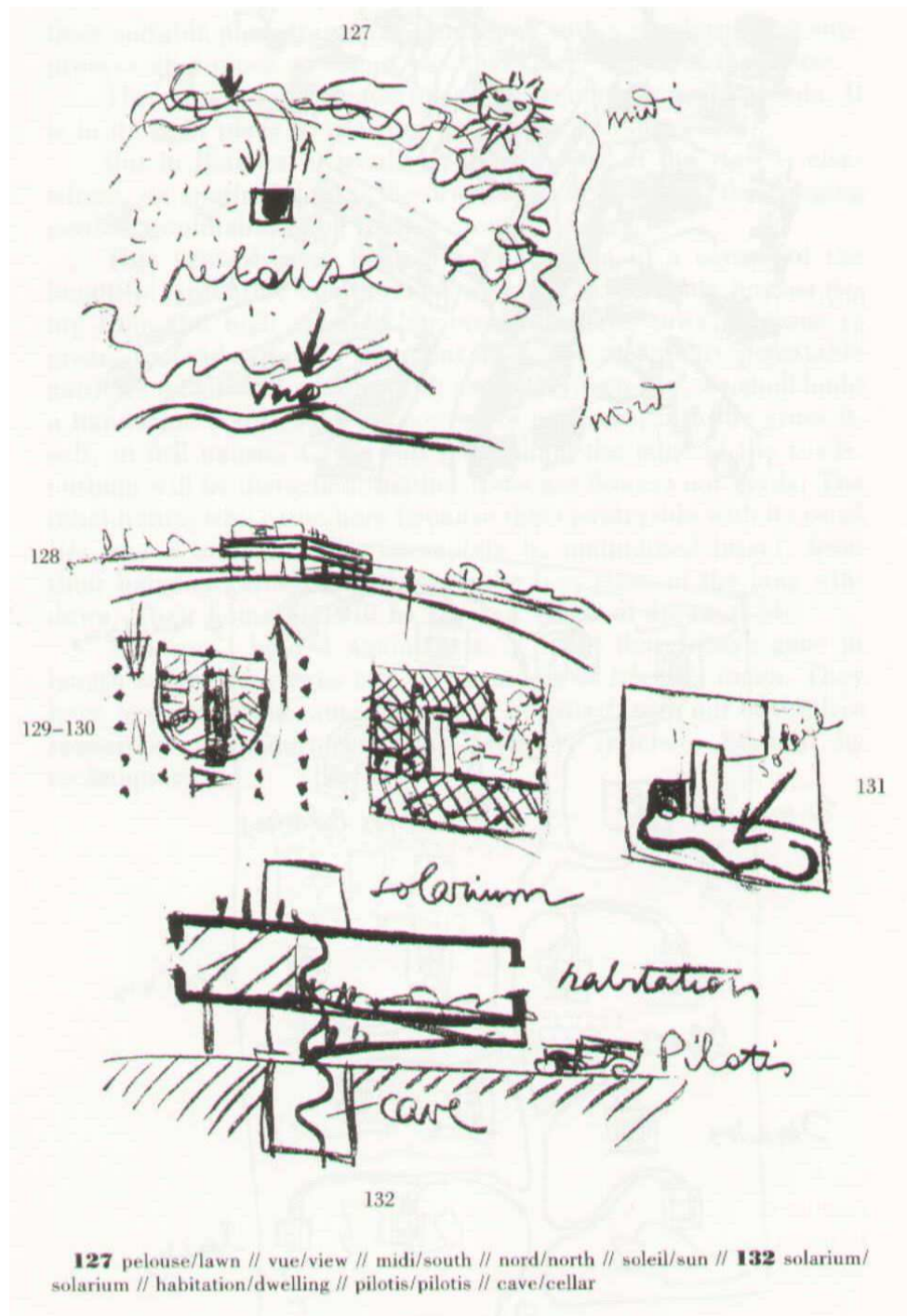


Figure 3.2. Le Corbusier, Analytical diagrams for Villa Savoye.
(Le Corbusier, *Precisions*, (Cambridge: The MIT Press, 1991), 137.)

The design and realization of Villa Savoye which appears as the culmination of a series of design experiments and of an adherence to rules that solidifies as the Five Points as well as the Promenade Architecture and the year 1929 marks a cornerstone in Le Corbusier's early career. This fact is also apparent in the arrangement of the first volume of his *Complete Works*; the grandiosity and the popularity of the Savoye scheme casts shadow over the following pages of the volume dedicated to projects such as the Mundaneum, La Cite Mondiale, Maisons Loucheur, Villa Church and Centrosoyus of Moscow.

Among these projects Le Corbusier also included the design for a house in Brussels, a scheme considered in 1929 but not realized.¹⁸³ It is a rectangular box raised on pilotis to allow car traffic under the building, which is blind on one of the longer sides. The scheme is very similar to that of Villa Cook, in which the ground floor is reserved for the entrance vestibule and the circulation of vehicles, the first floor for the bedrooms, the second floor for the living areas and the top floor for the library and the roof garden. The exterior perspective is a typical Le Corbusier drawing showing the building amidst landscape elements while an automobile gently proceeds under the building (figure 3.3). Upon further examination one can discover a figure in his swimsuit diving into a pool above the garage and in the longitudinal section one clearly reads that by making use of the sloping site, Le Corbusier placed a modest swimming pool on top of the garage which can be directly reached from the master bedroom. There is no written information on the two pages reserved for this project except for the drawing labels, therefore it is up to us to judge whether the

¹⁸³ Le Corbusier, *Oeuvre Complete*, v.1, 204-205. The project is labeled as Maison de M. X. a Bruxelles in the volume. On the official website of Fondation Le Corbusier, the unrealized 1929 project in Brussels is referred to as Maison J. Canneel.
[INTERNET, WWW] ADDRESS: <http://www.fondationlecorbusier.fr> [last accessed August 2007]



Figure 3.3. Le Corbusier, Perspective from a proposal for a house in Brussels.
(Le Corbusier, *Oeuvre Complete*, v.1, 204.)



Figure 3.4. Rem Koolhaas, Villa Dall'Ava.
(Home page: http://www.oma.eu/index.php?option=com_projects&view=portal&id=196&Itemid=10
last accessed September 1, 2007)

pool was included in the client's brief, or it was Le Corbusier who added one more athletic exercise into the building program.¹⁸⁴

More than sixty years after its emergence in a Corbusian project for a house in Brussels, the swimming pool lands on top of Koolhaas' Villa Dall'Ava in Paris (figure 3.4).¹⁸⁵ Completed in 1991, the villa reveals many references to Corbusian architecture, such as the hovering boxes, stylized pilotis, ribbon windows, the ramp as part of the architectural promenade, the car ending its journey under the building, and the roof garden (figure 3.5).¹⁸⁶ Even in his description of the site, Koolhaas is as lyrical as Le Corbusier's description of the landscape at Poissy:

The site was beautiful – a Monet. It slopes toward the Seine. Beyond it, the Bois de Boulogne, and beyond that panoramic view of the city; the Eiffel Tower is straight on axis. La Defense is to the left.¹⁸⁷

Although it is possible to suggest that Villa Dall'Ava invites comparison with the Savoye house with its formal vocabulary more than any other building (figures 3.5 and 3.6), Maison a Bordeaux promises more for a sustainable comparison. While the references in Villa Dall'Ava are more explicit and literal (and therefore can be examined through pictorial representation), they are much more subtle at the Bordeaux House (and promise a richer discourse through diagrammatic representation). What's more, while Villa Dall'Ava can be seen as a response to the constraints of

¹⁸⁴ Athletic exercise and sunbathing was an indispensable part of the modern life as Le Corbusier envisioned it, therefore provision of facilities for these activities was a programmatic necessity for a majority of his domestic projects.

¹⁸⁵ Beatriz Colomina suggests that the swimming pool on the roof of Villa Dall'Ava is an homage to Koolhaas' own story of the floating swimming pool of the Russian architecture students at the end of *Delirious New York*. See Beatriz Colomina "A Machine Was Its Heart: House in Floirac", *Assemblage* 37, 1998, 39. However, in *S,M,L,XL* we are informed that the idea of a swimming pool on the roof of the house that would allow to see the Eiffel Tower while swimming is part of the client's brief. See Rem Koolhaas, *S,M,L,XL*, 134.

¹⁸⁶ Jeffrey Kipnis claims that there are references to Villa Savoye, Farnsworth House as well as Johnson's Glass House in Villa Dall'Ava. See his "Recent Koolhaas", *El Croquis* 79, 28.

¹⁸⁷ Rem Koolhaas, *S,M,L,XL*, (New York: The Monacelli Press, 1995), 133.



Figure 3.5. Rem Koolhaas, Villa Dall'Ava.

(Home page: http://www.oma.eu/index.php?option=com_projects&view=portal&id=196&Itemid=10
last accessed September 1, 2007)



Figure 3.6. Le Corbusier, Villa Savoye.

(Home page: <http://cesarigd.club.fr/images/galps/savoy03l.jpg>
last accessed August 2007)

the site and the client's brief¹⁸⁸, Savoye and Bordeaux houses share more in conceptual formulation, which shall be discussed below in detail.

Both Villa Savoye and Maison a Bordeaux are single family houses located on the outskirts of significant French cities. While the former is planned as a weekend and summer retreat from the Parisian apartment of the Savoyes, the latter is supposed to be the permanent residence of the family after deserting their old town house in the medieval city. Both buildings are comprised of three levels and are envisioned by their architects in perspective sketches as hovering boxes above the ground (figures 3.7 and 3.8).

Le Corbusier's layering of the levels can be seen as a continuation, or rather, the perfection of his cliché: the ground floor is reserved for the vehicular circulation, services and the exhibition of pilotis, the *piano nobile* brings the living spaces and the bedrooms of the inhabitants around a hanging garden and the top floor is reserved for the roof garden containing architectural elements marking the end of the architectural promenade, framing the landscape and mimicking marine aesthetics. For Koolhaas' tripartite layering, perhaps one should turn to his own description of the house quoted here in length, not only for an exposure to the concepts behind the design decisions at once, but to reveal the inclination toward drama¹⁸⁹ in his architecture:

¹⁸⁸ The challenge posed by the site and the client's brief is summarized in the coupling of contradictory requirements: "He wanted a glass house. She wanted a swimming pool on the roof... The site was small. The house was big. It had to have the smallest possible footprint." Rem Koolhaas, *S,M,L,XL*, 134.

¹⁸⁹ About this tendency toward drama and literature in Koolhaas' architecture, Beatriz Colomina observes that this is "the way we are always allowed into OMA's work, through a story". Beatriz Colomina, "A Machine Was Its Heart: House in Floirac", 39.

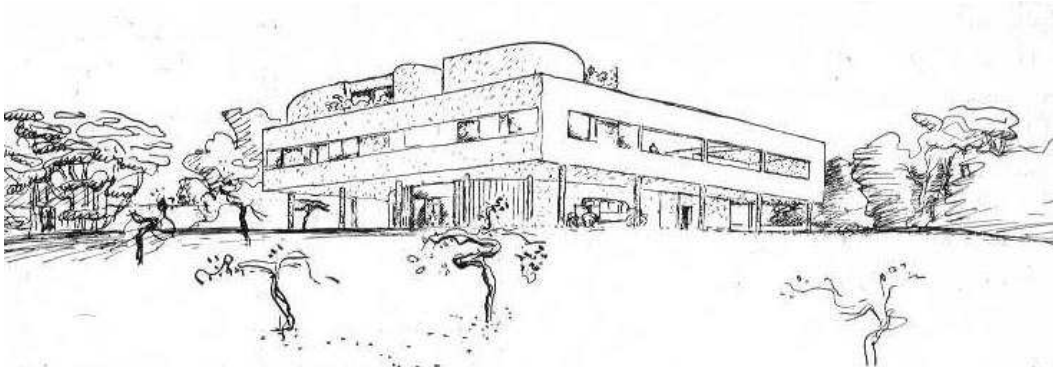


Figure 3.7. Le Corbusier, Perspective sketch for Villa Savoye.
(Le Corbusier, *Oeuvre Complete*, v.1, 187.)

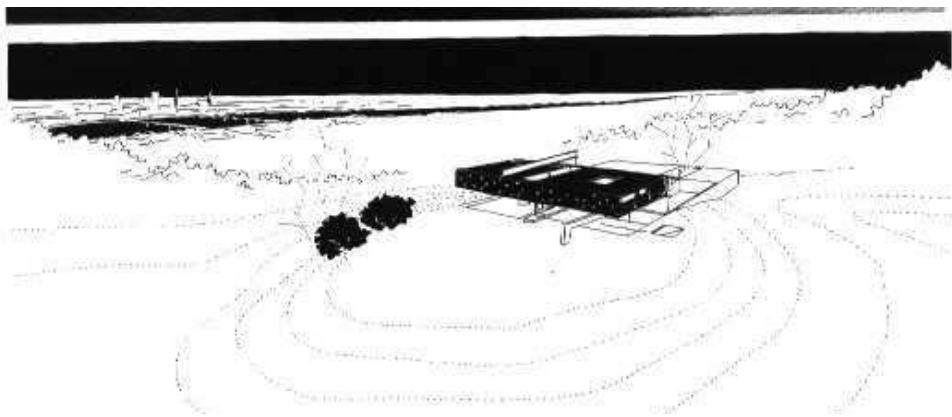


Figure 3.8. Rem Koolhaas, Maison à Bordeaux, perspective sketch.
(Rem Koolhaas, "Maison à Bordeaux", *El Croquis* 79, 164.)

A couple lived in a very old, beautiful house in Bordeaux. Eight years ago, they wanted a new house, maybe, a very *simple* house. They were looking at different architects. Then, the husband had a car accident. He almost died, but he survived. Now he needs a wheelchair... Two years later, the couple began to think about the house again. Now the new house could liberate the husband from the prison that their old house and the medieval city had become. *Contrary to what you would expect*, he told the architect, *I do not want a simple house. I want a complex house because the house will define my world...* They bought a mountain with a panoramic view over the city. The architect proposed a house – or actually three houses on top of each other. The lowest one was cavelike – a series of caverns carved out from the hill for the most intimate life of the family. The highest house was divided into a house for the couple and a house for the children. The most important house was almost invisible, sandwiched in-between, a glass room – half inside, half outside – for living.¹⁹⁰

The client's brief nearly inhibited a flat dwelling that would automatically come to mind as a solution for the ease and comfort of the handicapped father. In line with the client's brief, Koolhaas refrained from a single storey solution and stacked three boxes on top of the other that helps to establish the link to Le Corbusier's triple layering at Savoye, however, he discarded the ramp. So while erasing one of the most significant elements of Le Corbusier's scheme that would very well suit the circumstances, he took another one and twisted it around. Instead of its implied aesthetics, he placed the machine itself right at the heart of the house:

The man has his own *room*, or rather *station*. A lift – 3X3,5 meters – that moved freely among the three houses, changing plan and performance when it *locked* into one of the floors or floated above. A single *wall* intersected each house, next to the elevator. It contained everything the husband might need – books, artwork, and in the cellar, wine... The movement of the elevator changed each time the architecture of the house. A machine was its heart.¹⁹¹

¹⁹⁰ Rem Koolhaas, "Maison a Bordeaux", *El Croquis* 79, 164. See also the official website for a slightly extended version of this text. [INTERNET, WWW], ADDRESS: http://www.oma.eu/index.php?option=com_projects&view=project&id=19&Itemid=10 [last accessed October 2007]

¹⁹¹ Rem Koolhaas, "Maison a Bordeaux", 164.

Structure

Rowe was able to establish a strong foundation for his analysis in his “Mathematics” between the Corbusian and Palladian architecture through the abstract logic of the diagram, without which the comparative effort of his project would risk credibility. Stein and Malcontenta differ in structural systems, however, the diagrams showing the lines of support reveal a comparable bay structure. A similar analogy does not work between Savoye and Bordeaux houses. The generic structural system of Savoye is a sixteen square grid which is still readable in the placement of pilotis and the planning of the piano nobile even after Le Corbusier makes necessary adjustments (the three columns on the main axis are doubled and pulled apart to make room for the ramp and the entrance) for the central location of the ramp and the corresponding main entrance on its central axis (figure 3.9).

Whereas at Bordeaux, the structural system is composed in the form of an abstract device or a machine whose components are related in a three-dimensional play to keep the building in equilibrium (figure 3.10). The number of these components is minimized by formulating the upper house as a rigid concrete box and allowing it to rest on three points of support as if it were a three-legged table. Two of these points are joined with a lintel and the third one is thought of as a hollow column that houses a spiral staircase. The instability is enhanced by keeping the axis of the hollow column slightly off-centered and to resolve the resulting inequilibrium, a giant lintel is placed on top of the concrete box as a counter-weight that protrudes towards the garden to be tied to the ground with a steel rod (figure 3.11).

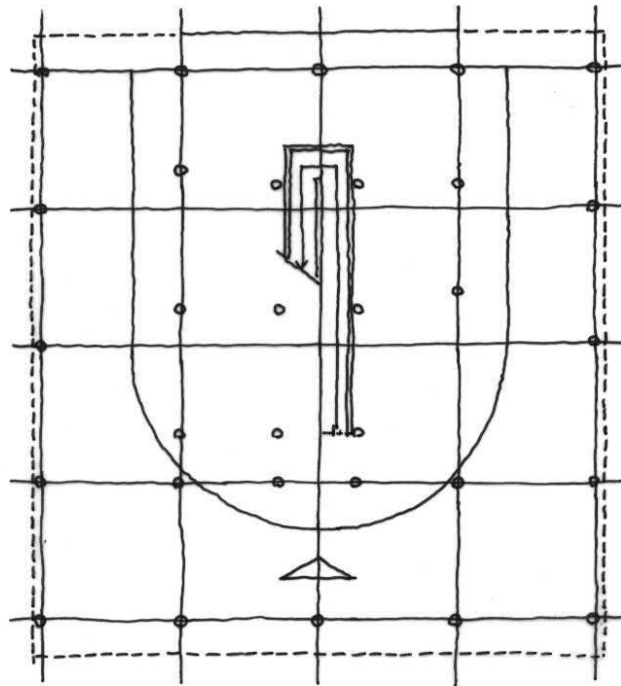
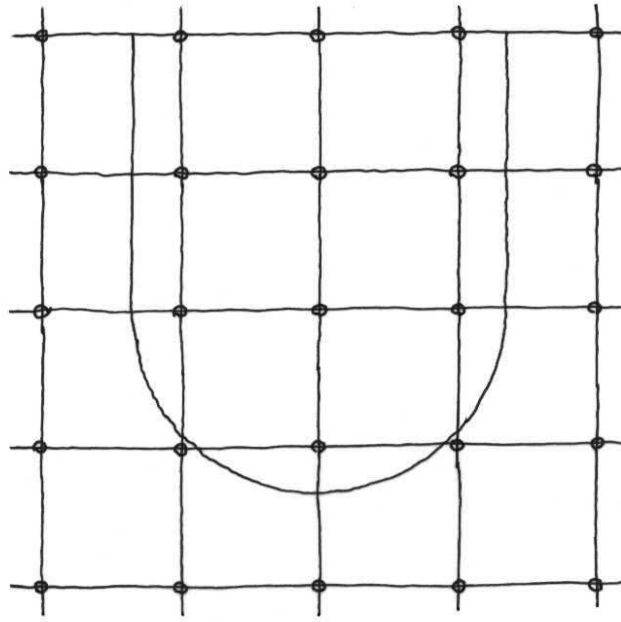


Figure 3.9. Villa Savoye, Generic plan diagram (above) and adjusted version.
(Drawn by the author after Geoffrey H.Baker)

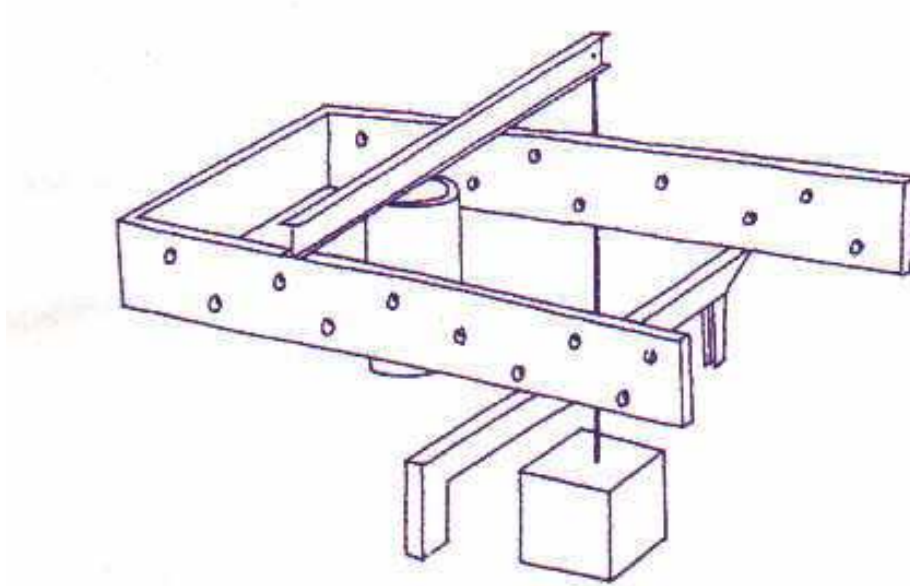


Figure 3.10. Rem Koolhaas, Maison a Bordeaux, Structural diagram.
(*Arforum*, (November 1998), 94.)

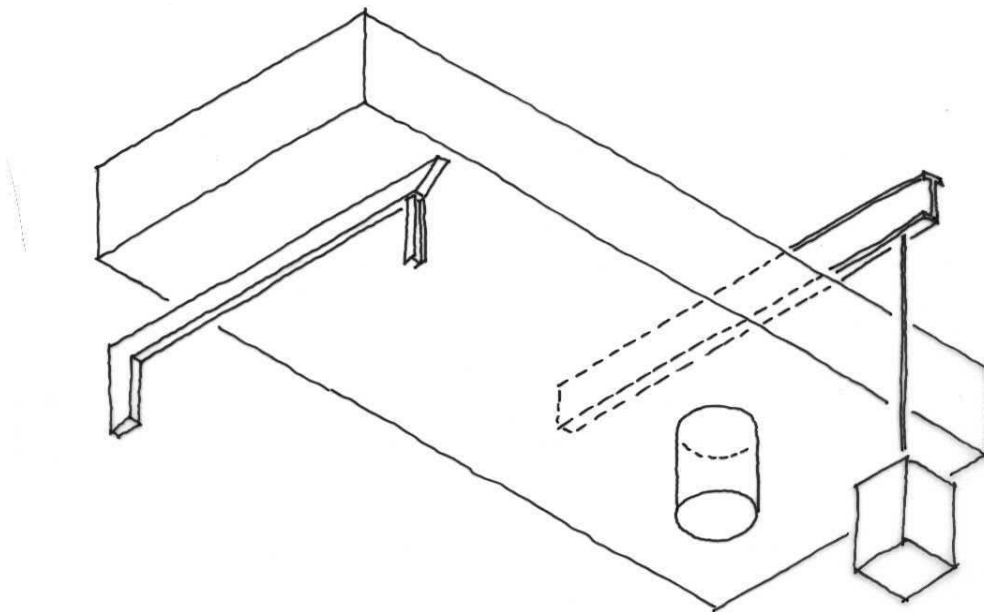


Figure 3.11. Maison a Bordeaux, Worm's-eye isometric view, Structural diagram.
(Drawn by the author)

Thus, against the uniformity and stability of the structural frame of Villa Savoye, Maison a Bordeaux deploys an intricate play of structural suspense, in which elements varying in size, geometry and material are attached to one another in such a way that removal of any one of the elements would cause the whole system to collapse. Obviously, any structural system is dependant on each and every one of its components and a defective element may cause serious problems for the whole system. Yet, in most instances the frame is designed for the distribution of loads and forces, as well as the structural risks. Whereas in Bordeaux, all structural elements are assigned critical roles in the system, such that for instance, cutting off the steel rod that ties the roof lintel to the ground would unleash the enormous impact of gravity on the concrete box which would squash the lower levels. Therefore it would be easy to judge the structural system of the Bordeaux House to be uneconomical and irrational, however, what is lost on the side of structural economy and rationality is gained on the side of psychological effects and metaphorical readings, which shall be analyzed further below.

Movement

While structure does not offer much for an analogy between the two buildings, the emphasis on movement is common to both. Although the interpretations on the idea of movement take on different forms and meanings, both buildings feature vertical circulation elements as the center of focus.

Thus, while the ramp emerges as one of the most significant architectural elements in Villa Savoye, Maison a Bordeaux features the elevator for the leading role in its conceptual formulation (figure 3.12). The underlining of movement between the (three) layers necessitates a sectional representation in the study of the conceptual diagrams of the two buildings (figures 3.13 and 3.14). Although it can be argued that any building with multiple layers requires linking of slabs with vertical circulation elements, this requirement does not necessarily lead assigning them leading roles in conceptual formulation. Thus, in most instances these elements are contained in compartments; and when they are exposed, it is usually for aesthetic reasons.

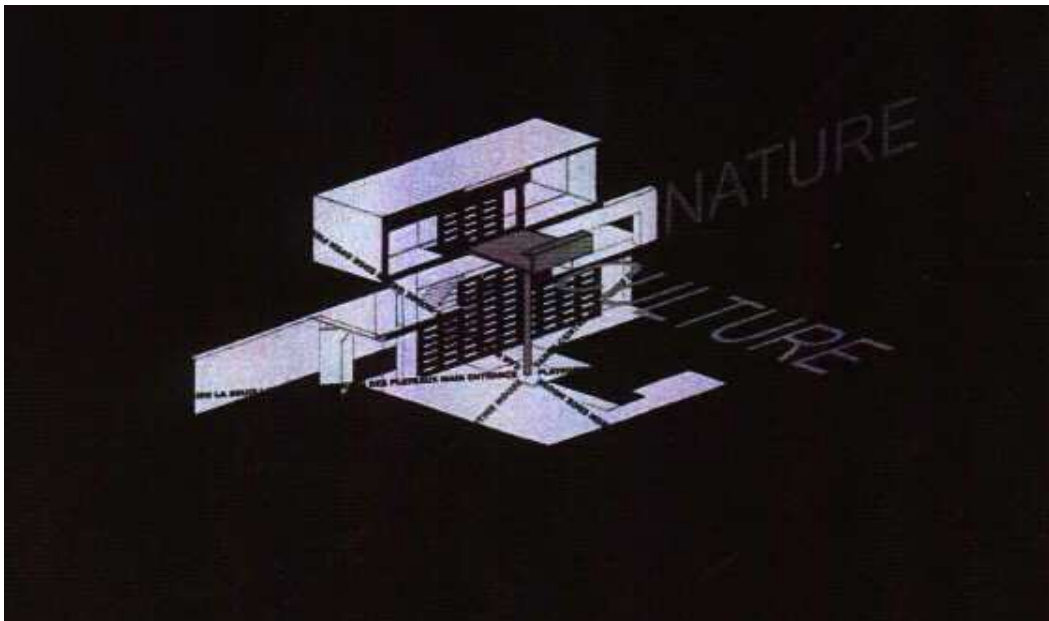


Figure 3.12. Rem Koolhaas, Maison a Bordeaux, conceptual isometric drawing.
(Rem Koolhaas, "Maison a Bordeaux", *El Croquis*, January 2007 , 72.)

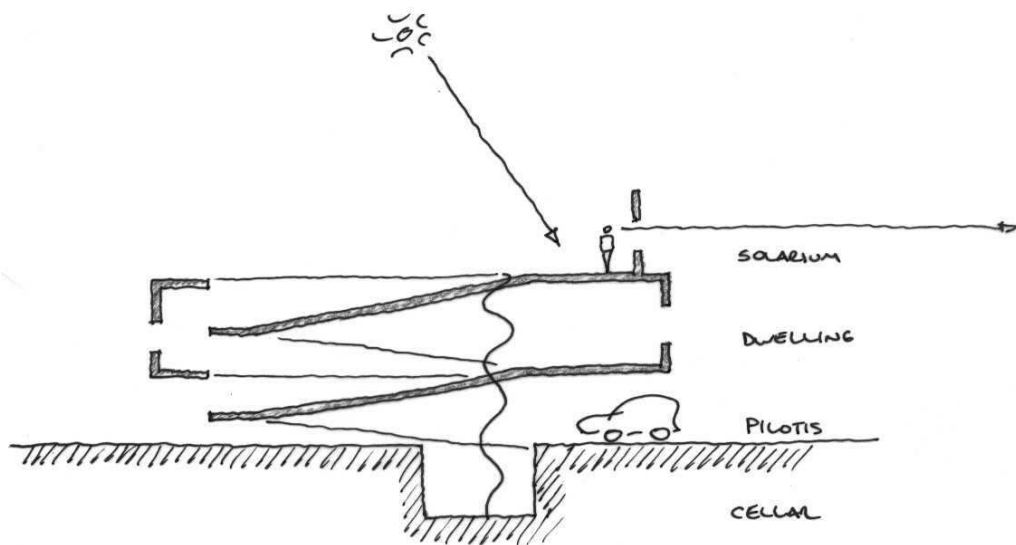


Figure 3.13. Villa Savoye, conceptual section diagram.
(Drawn by the author after Le Corbusier's analytical sketch)

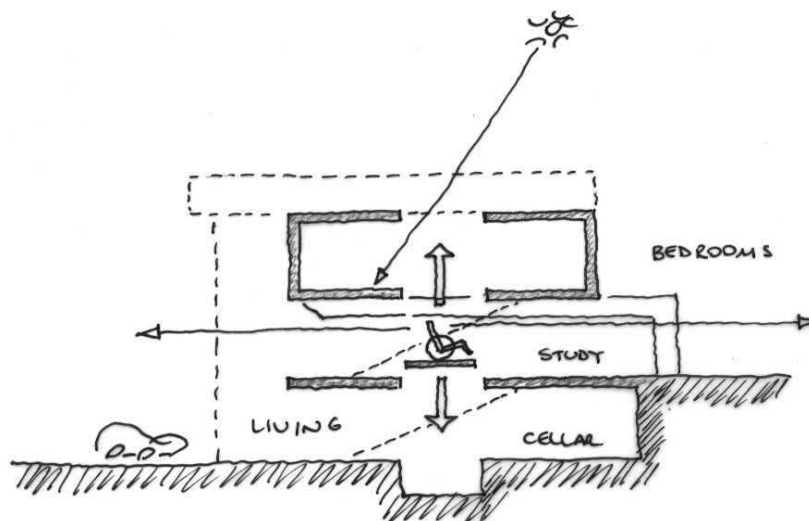


Figure 3.14. Maison a Bordeaux, conceptual section diagram.
(Drawn by the author)

In the second volume of his complete works, Le Corbusier openly announces that he borrows the ramp from the architecture of North Africa, as an antidote against the static viewpoint of Baroque architecture. He says that architecture “is appreciated on the move, on foot; by walking and moving around, one can see how the architecture’s ordering devices unfurl”.¹⁹² Examining Le Corbusier’s own analytical drawings (figure 3.2) reveals the fact that the architectural promenade is extended to include the approach to the villa on a vehicle. The cars proceed under the building in circular motion to drop their passengers at the entrance, park in the garage or drive off (figure 3.15). From the entrance hall which allows one to appreciate the view of the immediate surrounding through its transparent membrane, the ramp leads to the *piano nobile* where the private and public spaces are organized around the hanging garden. The ramp continues outside to reach the roof garden which is contained by a thin curvilinear membrane that marks the end of the architectural promenade to allow a mediated view of the landscape through its rectangular opening (figure 3.16). Richard Etlin instrumentalizes this movement scheme in his allusion to the climbing experience at the Acropolis in Athens to discuss the origins of Hellenism in Corbusian architecture¹⁹³ and he also proposes an alternative reading of the architectural promenade in which Villa Savoye “ritually recreates the drive from Paris to the suburban villa”.¹⁹⁴ In this reading, the ramp prolongs “the smooth motion of the car” and “the architectural promenade culminates on the roof where an opening in the garden wall represents the original view through the windshield of the car”.¹⁹⁵

¹⁹² Le Corbusier, *The Complete Architectural Works, vol.2, 1929-1934*, 24. Quoted in Baltanas, *Walking Through Le Corbusier*, (New York: Thames&Hudson, 2006), 56.

¹⁹³ Richard A. Etlin, “Le Corbusier, Choisy, and French Hellenism: The Search for a New Architecture”, *The Art Bulletin*, v.69, n.2 (1987).

¹⁹⁴ Etlin as cited in Kari Jormakka, *Flying Dutchmen*, (Basel:Birkhauser, 2002), 34.

¹⁹⁵ Ibid.

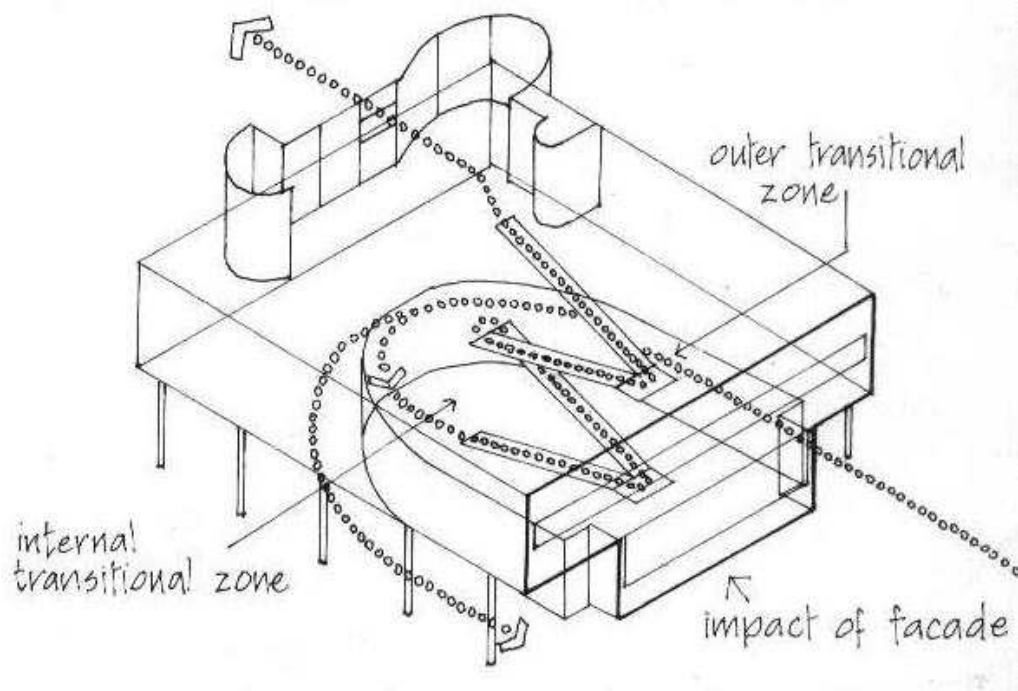


Figure 3.15. Villa Savoye, movement diagram.

(Geoffrey H. Baker, *Le Corbusier, an Analysis of Form*, (London: Van Nostrand Reinhold, 1984), 211.)



Figure 3.16. Villa Savoye, ramp ending with opening on roof partition.

(Home page: <http://cesarigd.club.fr/images/galps/savter01l.jpg>
last accessed August 2007)

The movement scheme of Villa Savoye is almost like a carefully planned ceremonial procession, repeated by the visitors and inhabitants of the house. At first glance, a similar movement pattern is also at stake at Maison a Bordeaux. Vehicles drive up to the hill from below to catch glimpses of the hovering upper box of the house as well as the giant roof lintel (figure 3.17) and upon entering the sunken garden, the car path makes a circular turn to allow the vehicles drop their passengers at the entrance of the lower level (figure 3.18). The elevator assumes the role of the ramp of Savoye and in its slow motion takes its passengers on a ride through the section of the house with smooth but constant changes in viewpoints. Even the rectangular window in the roof partition of Savoye that marks the end of the architectural promenade (figure 3.16) finds its reflection in the skylight of the elevator shaft of the Bordeaux House; the horizontal line of sight towards the horizon at Savoye is rotated towards the sky at Bordeaux to emphasize the vertical movement (figure 3.19).



Figure 3.17. Maison a Bordeaux, Approach to the house.

(Home page: http://www.oma.eu/index.php?option=com_projects&view=portal&id=19&Itemid=10 last accessed September 1,

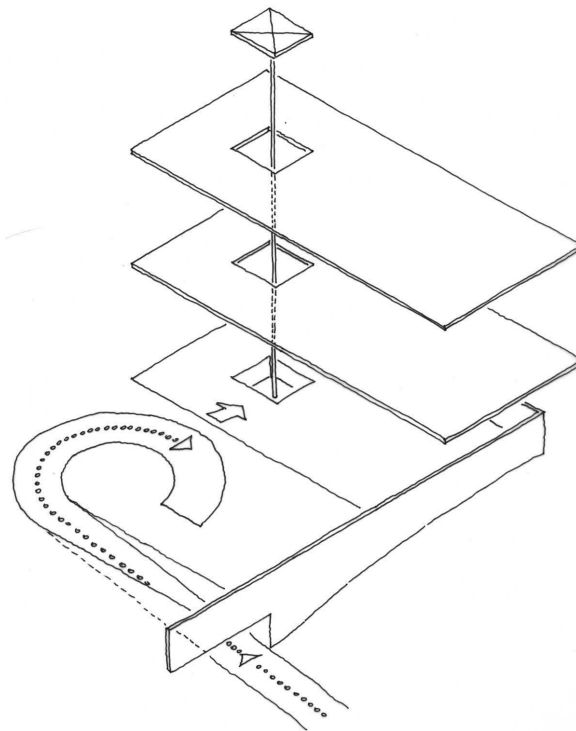


Figure 3.18. Maison a Bordeaux, Approach and movement of elevator.
(Drawn by the author)



Figure 3.19. Maison a Bordeaux, view of elevator platform and skylight.

([Home page: http://www.oma.eu/index.php?option=com_projects&view=portal&id=19&Itemid=10 last accessed September,

However, the dominance of the elevator tends to blur the fact that the three layers of the house are connected with four vertical circulation elements: in addition to the elevator, there are three staircases. The location of these circulation elements imply that they are reserved for specific use: the staircase at one wing of the house links the kitchen, the study and mother's bedroom and therefore reserved for the mother; the spiral staircase contained in the hollow column links the TV room and children's rooms by-passing the mid-floor and therefore reserved for the children; the staircase near the entrance only leads to the mid-floor and is for the guests; and finally, the elevator is reserved for the father (figure 3.20). In addition to this multiplicity, there are several entrances both on the lower level and mid-level. Against the carefully planned and dictating linearity of Savoye's movement ritual, the Bordeaux House becomes the field of play for free movement and chance encounters, at least on the lower levels.

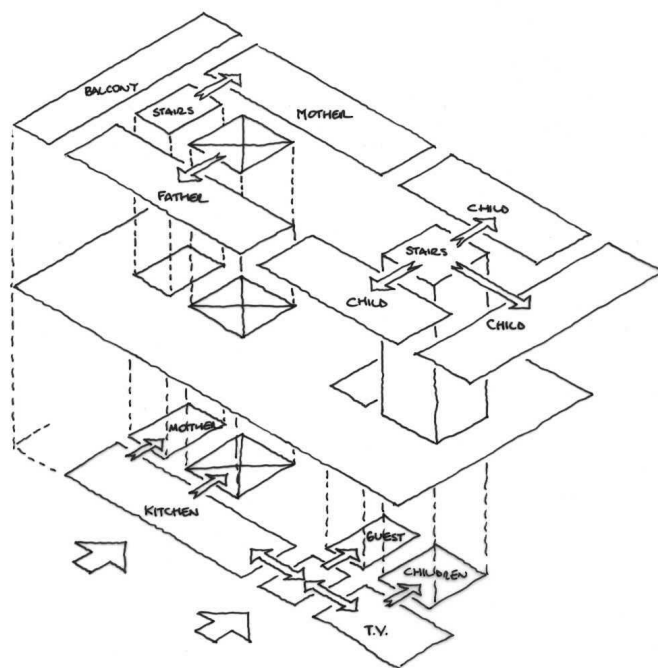


Figure 3.20. Maison à Bordeaux, Spatial analysis.
(Drawn by the author)

With its plasticity merging the horizontal and the vertical, its deep incision at the center of the volume assisting the separation of public and private spaces and its provision of constantly changing viewpoints, the ramp is assigned a critical role in the conceptual formulation of the Savoye house. However, despite all these assets suggesting certain dynamism, it is possible to argue that its role is passive in comparison to the role of the elevator at Maison a Bordeaux, where it becomes the major architectural element at the heart of the house, “changing the plan and performance” with its movement. Since it has been freed from its enveloping walls, the presence and absence of the platform of the elevator brings dramatic changes to a floor. When it locks to the upper house for instance, the slab of the upper floor becomes a whole while the void it leaves behind becomes the gallery which connects the lower and middle ‘houses’. The movement of the elevator also provides a reading of the section of the house for its riders, as well as a cinematic movement through the slow motion of its framing the lives of the three ‘houses’:

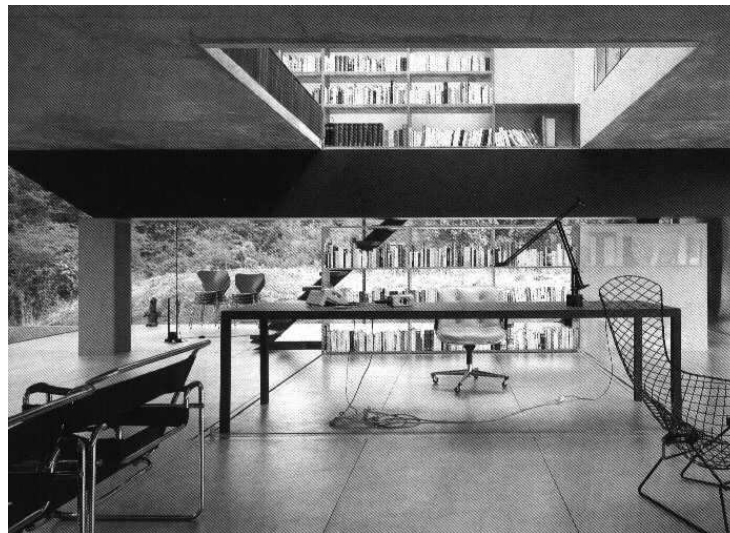


Figure 3.21. Maison a Bordeaux, view of elevator platform at middle house.

(Home page: http://www.oma.eu/index.php?option=com_projects&view=portal&id=19&Itemid=10 last accessed September 1,

The elevator is the most cinematographic space in the house and the most architectural. It dictates a sectional journey through the heart of the house. The elevator returns to its exhilarating beginnings. Gideon wrote about the spatial experience of moving through the Eiffel Tower: "The interpenetration of continuously changing viewpoints creates, in the eye of the spectator, a glimpse into four-dimensional experience".¹⁹⁶

On the other hand, for Kari Jormakka, just like the wheelchair of the owner, the elevator becomes "a prosthetic extension of the human body" in Maison a Bordeaux.¹⁹⁷ However, it should be noted that the elevator does more than what would be expected from a prosthetic device. Does it not only provide the father with the mobility to pass from one 'house' to the other, but with the ability to change the architecture of the house as well. The cellar dug into the hill is inaccessible without the presence of the platform of the elevator and the absence of the platform on a floor creates a feeling of insecurity. Thus, it is possible to claim that it helps to reconstruct the power of the paternal figure bruised with the consequences of the accident: the presence of the father on one of the floors makes that space complete, and reversely his absence leaves a significant void behind.

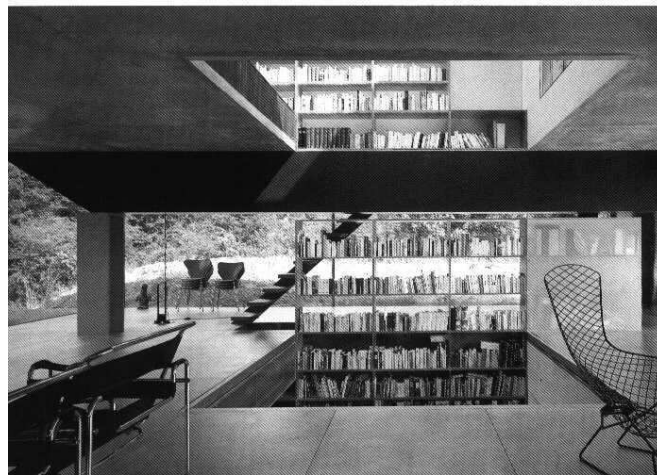


Figure 3.22. Maison a Bordeaux, view of elevator void.

(Home page: http://www.oma.eu/index.php?option=com_projects&view=nortal&id=19&Itemid=10 last accessed September 1

¹⁹⁶ Beatriz Colomina, "A Machine Was Its Heart", 42.

Boundary

While Le Corbusier's design focuses on the perception of spaces by the universal eye, Koolhaas' solution focuses on the client's brief requiring complexity in the definition of its microcosm. Le Corbusier's triple layering is an extension of his insistence on elevating the living spaces above the ground and on substituting the roof garden for the losses on the ground floor. The ribbon window marks the end of the understanding that the house should have a front and a back, aids in distribution of light uniformly and provides a seamless line of sight. Koolhaas' layering is aimed at creating three different houses within a house; and in this formulation does the periphery of each house not only substantially vary in physical terms, but in the way it plays a mediating role between the inhabitants and the environment as well. The boundary of the middle house is almost totally transparent, and this transparency is further enhanced by the sliding glass panels to dissolve it in an effort to unite the interior and exterior space:

It is totally transparent. Half air, half glass. Void and solid melt. Interior and exterior no longer are opposed. The membrane of enclosure and the structure disappear, dematerialize.¹⁹⁸

The upper house, on the other hand, is a closed box with circular openings seemingly placed at random, giving it the spongy or the Swiss cheese look. As a sign of the need for privacy, this 'house' is a closed box, allowing a limited and mediated visual contact through its small circular openings. And the lower house is buried into the hill by carving out some of its spaces from the ground, creating a sunken courtyard or a patio to which the intimate spaces such as the kitchen and dining open. With this burying and carving procedure, not only are these spaces cut off from the surrounding, but the man made elements and the natural setting

¹⁹⁷ Kari Jormakka, *Flying Dutchmen*, 25.

¹⁹⁸ Beatriz Colomina, "A Machine Was Its Heart: House in Floirac", 43.

come together to become part of the boundary of these spaces (i.e., rocks serving as walls) along with the man made elements.

Symbolism

The distribution of functions among three 'houses' that are stacked on top of another and the variation in their definition of the boundaries provide an acceleration towards the client's requirement of "a complex house". And perhaps the most significant of those three houses, at least in terms of its envelope, is the upper house, seemingly perforated at random and possibly posed against Le Corbusier's interpretation of *façade libre*.¹⁹⁹ Koolhaas presents a series of diagrams to account for the dispersal of these openings, from which one can infer that "the single, universal eye of Le Corbusier's standing men at one meter seventy centimeters from the ground has been replaced by a multiplicity of eyes", including that of the children and the wheelchair user.²⁰⁰ The openings are positioned according to certain locations of the subjects in their rooms, such as the bed, the desk and the shower. The diagrams precisely explain that the first type of openings "provide glimpses of the horizon", the second "frames views of the surrounding landscape", while "the third type, according to OMA, comprises anti-claustrophobic holes framing the nearest piece of ground".²⁰¹ Despite the justifications and the precision of the diagrams, locations of the openings naturally do not answer all the

¹⁹⁹ For an earlier version of these circular openings in Koolhaas architecture one should see the Zeebrugge Sea Terminal in Belgium. The building is envisioned as a landmark by the seafront, emerging as the consequence of the opening of the tunnel between England and the continent. The terminal is thought of as an attraction center combining multiple activities in its program and as an intersection of various transportation axes, in an effort of the "ferry companies operating across the channel to make the crossing more exciting". "The building crosses a sphere with a cone" according to Koolhaas and reminds the helmet of an astronaut for some. The circular openings belong to the hotel rooms facing the sea, probably as a gesture toward marine aesthetics. These openings are organized to follow the order and typicality of the hotel rooms, in contrast to the ones in Bordeaux, which are dispersed on the facades.

²⁰⁰ Beatriz Colomina, "A Machine Was Its Heart: House in Floirac", 44.

²⁰¹ Ibid.

contingencies and they remain a possible selection among endless combinations. However, they invite a comparison to Le Corbusier's ribbon window, about which Colomina speculates that

if the fenetre-en-longueur separated middle ground from foreground and background, eliminating the sense of depth of the porte-fenetre, the Swiss cheese windows in Floirac separate background, middle ground and foreground, presenting them as isolated fragments, as if there had been an explosion.²⁰²

Blanca Lleo suggests a more poetic reading resorting to Lewis Carroll's world of fiction:

Since the children are still growing, or at least two of them, they will feel the room in constant change until they stop growing. Their height will change what they see through the windows. The smallest child will be like Alice in Wonderland. The window will be lower every day and in a few years she will have to crouch to look outside. On the other hand, she will only be able to look out from other windows when years have passed. As she grows, she will have a new vision.²⁰³



Figure 3.23. Rem Koolhaas, Maison à Bordeaux.

(Home page: http://www.oma.eu/index.php?option=com_projects&view=nortal&id=19&Itemid=10 last accessed September 1

²⁰² Ibid., 44-45.

Another Corbusian element subject to mutation in the hands of Koolhaas is the pilotis. In Villa Dall'Ava they are stylized as thin steel tubes, sticking crookedly into the ground and looking as if they were a bunch of needles dropped accidentally into the ground to carry one of the apartments without being straightened back up. At Bordeaux, the tubes are dramatically reduced in number, thickening in diameter instead. In fact, there is only one pile and it also serves as the cylindrical shell for the spiral staircase connecting all three floors. It is one of the two elements carrying the perforated box of the upper house, the other being a huge lintel protruding from the main volume and stepping into the upper garden. The slender pilotis elevating Le Corbusier's universal boxes transforms into a single, colossal pillar, and what is lost on the side of aesthetics is gained on the side of the 'hovering effect'. To strengthen the alienation, the surface of the cylinder is covered with reflective metal sheets, turning it almost into a mirror.²⁰⁴ This reduction in the number of structural supports, elimination of solid partitions and total transparency on the periphery strengthens the flying effect, especially when the building is being viewed from outside. For someone standing in the middle house, however, it probably offers a totally different experience. The enormous static load of the concrete box of the upper house resting on a single lintel and a cylindrical mirror exerts its pressure on the beholder, creating a feeling of anxiety of being smashed in between, which is definitely not equal to, but perhaps thought of to remind the stress of the weight of deprivation on the shoulders of the father.

The roof lintel, whose structural role was analyzed earlier, can also be seen as a reflection of the roof partition of Villa Savoye which attained several functions and meanings. The curved plane of the wall symbolically marks the end of the promenade at Savoye, while offering a mediated

²⁰³ Blanca Lleo in conversation with Colomina, in her "A Machine Was Its Heart: House in Floirac", 45.

²⁰⁴ Colomina likens the mirror of the column to the ones in the image halls of amusement parks. Ibid., 41.

view of the horizon as well as protection from north wind for the users of the solarium. Also with its structure (expression of the ribs supporting the screen) it “resembles ship construction” to strengthen the ocean-liner metaphor.²⁰⁵ Similarly, the roof lintel at Bordeaux acquires symbolical meanings in addition to its structural role. It bears a certain ambiguity in that it appears to be carried by the box it is placed on, rather than carrying the box itself. With this reversal, it adds to the flying effect of the upper box and to the representation of the dramatic stress on the inhabitants of the house: it seems as if the spongy box that contains the bedrooms (which contains, in a way, the private worlds of the inhabitants) would fly into the sky, if someone were to cut the cable that ties the lintel to the ground.²⁰⁶

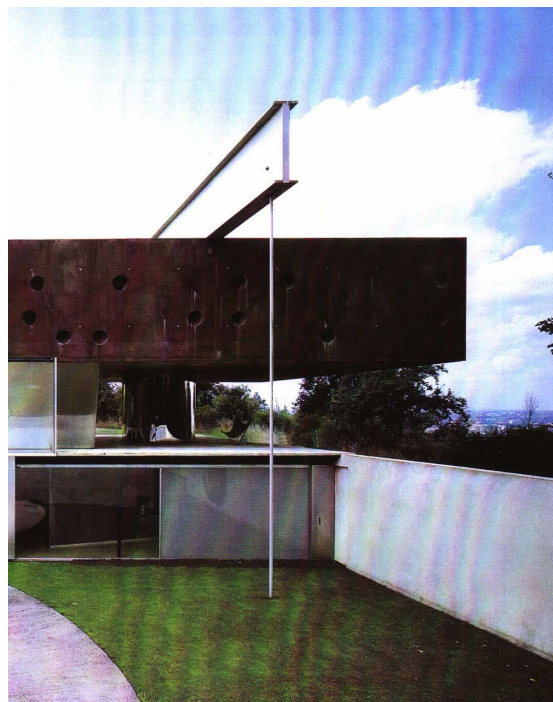


Figure 3.24. Rem Koolhaas, Maison a Bordeaux, roof lintel.
(Rem Koolhaas, “Maison a Bordeaux”, *El Croquis*, January 2007 , 71.)

²⁰⁵ Geoffrey H. Baker, *Le Corbusier, an Analysis of Form*, (London: Van Nostrand Reinhold, 1984), 207.

²⁰⁶ The metaphor is borrowed from Colomina’s reading.

Different Worlds

Although one can discover many references to Le Corbusier in Koolhaas' architecture, it is possible to sort out many differences along with the similarities in comparing the two. First, the structural system with which Rowe was able to establish a strong foundation for his analysis in his "Mathematics" essay between the Corbusian and Palladian architecture does not operate in the same way between Le Corbusier and Koolhaas. Koolhaas makes use of the advances in structural technology to defy gravity, where what Le Corbusier does is to lift his universal boxes on a universal grid (of 5, 2.5 and 1.25 meters) and to build one of his five points (free façade) on the potential of the relatively humble 1.25 meters projection. Thus, while Le Corbusier achieves the hovering effect either by carving out the periphery of the ground floor or by using a modest cantilever to expose the pilotis, Koolhaas brings the idea of 'flying boxes' to literal senses by forcing the structural system to the extent of achieving enormous cantilevers and consulting what may be called the (architectural) "tricks of the trade".²⁰⁷ The box containing the parents' apartment in Villa Dall'Ava for instance, is held in the air by four columns and one side of the prism spans a cantilever close to five meters, while the other side rests on slender steel posts on the corners. The two major piles at the center are contained in the glass box of the ground floor, so that especially at night when the curtains are drawn and the lights are turned on, the effect of flying is on play. In House at Bordeaux, this effect is even further exaggerated by tying the upper box containing the bedrooms and resting on the transparent middle box down to earth with a

²⁰⁷ Benton calls repeating patterns "tricks of the trade" in Le Corbusier's architecture such as the partition walls incorporating built-in cupboards, the concrete tablettes and the fireplaces. Tim Benton, "Villa Savoye and the Architects' Practice", 84.

cable at the tip of the roof lintel to suggest that the box would fly away otherwise.

Second, the principles of the architectural promenade display nuances in both. While they both promote the enriched spatial experience of the spectator moving in and around buildings on foot, Le Corbusier's repetition of the *promenade architecturale* is more static, in that it is based on a cliché of people arriving at the building on a car, being dropped off in front of or under the building, being pulled up from the entrance hall by vertical circulation elements and arriving at the roof garden by experiencing the interior spaces. This perceptive cliché shows almost no variations throughout the domestic projects of the 1920s. Whereas Koolhaas takes the liberty to insert delays and fractures into the linearity of the architectural promenade, or to change the sequence of spaces taking part in it. For instance in Villa Dall'Ava, the linearity of the circulation path is traumatized once people take the ramp from the entrance vestibule up to the living space. The two staircases leading to the separate apartments of the parents and the daughter are placed on both ends of the extruded rectangle of the living space, and what's more, one has to go out into the garden through a sliding glass panel to take another staircase going up to the roof garden and the pool. In the House For Two Friends in Rotterdam, which Koolhaas refers to as "a parody of the archetypal Dutch section – high water, dike, low land", the spaces are organized in two levels around a continuous path that starts from the street on the low level, goes by the patio at the heart of the house, leaves the building as a boardwalk on the upper level and ends by the bank of the water.²⁰⁸ In House at Bordeaux, the roof garden becomes a sunken garden or a sunken courtyard which can be accessed through a circular slot on one of its circumscribing walls. Upon entering the courtyard one is isolated from the environment and the view and he or she has to take the

²⁰⁸ Rem Koolhaas, *S,M,L,XL*, 67.

elevator up to the first floor, which coincides with the middle house in Koolhaas' formulation, and which is almost totally transparent on the periphery, to appreciate the view and the landscape. If raised by the elevator one more floor up one is in the spongy box that contains the bedrooms, which allows mediated views of certain objects in the vicinity of the house through its circular openings on its walls. Thus, it can be claimed that in his employment of references to precedents, Koolhaas avoids clichés.

Third, the aesthetic predilections of the architects show significant deviation from one another. Le Corbusier is a purist, employing a vocabulary of basic geometric shapes and white-washing his elevated 'boxes' in search of a unifying, universal language. He is quite confident that the machine aesthetic (which he admired) and the ideas of streamlining, mechanization, fabrication it brings have a sense of poetry and beauty of its own, which is not in contradiction to the traditional understanding of these terms.²⁰⁹ For Koolhaas, on the other hand, beauty, at least in its most conventional meaning, is not a priority. In his "neo-modern avoidance of formal excess"²¹⁰ and search for interaction or at least communication between the building and the city even in the small scale projects, the envelope gets fractured, fragmented or dissolved resulting in a "rejection of the renewed call for the supremacy of beauty in architecture".²¹¹ It is not for nothing that Somol defines his architecture as

²⁰⁹ Le Corbusier opens his second lecture in Buenos Aires by meditating on a sketch which he begins by drawing three plates that contain 'technique', 'sociology' and 'economy' and matches them with terms such as standardization, industrialization, taylorization, chemistry and physics. He draws a line above these and introduces emotional figures such as a flying bird, smoking pipe and a cloud, on top of which he writes: "techniques are the very basis of poetry". After this, he starts by promising his audience "a dazzling poem: the poem of architecture of modern times". After a series of analyses and calculations, he finishes his lecture by claiming that his analyses and "crayon sketches encircle a fabulous poetry: the lyricism of modern times". Le Corbusier, *Precisions*, 35-66.

²¹⁰ Jeffrey Kipnis, "Recent Koolhaas", 26.

²¹¹ *Ibid.*, 27. Kipnis is referring to Rafael Moneo's acceptance speech at the Pritzker ceremony in which he complains about the loss of interest on the side of necessity and beauty in contemporary practice.

one that is “delivering form without beauty, function without efficiency”. Jeffrey Kipnis even goes further to mention its “cheap, even ugly, construction”, referring to Koolhaas’ use of coarse and cheap everyday (and locally available) materials such as plywood, corrugated plastic or metal panels, fence link, chipboard and low grade exposed concrete in many projects.²¹²

²¹² Ibid.,29. Kipnis mentions Koolhaas’ decision to use the cheap and locally available low grade concrete in Congrexpo, Lille. For him, the “architect hoped the success of Congrexpo would be measured by the degree to which it intensified the buzz of activities... rather than the quality of its construction”.

CHAPTER 4

CONCLUSION

This study underlines diagrams' role as mnemonic tools in architectural design and instrumentalizes a comparative analysis towards understanding the nature of such a role through the dialogue initiated between the objects of its comparison. The relevance and significance of the comparison between Le Corbusier's Villa Savoye and Koolhaas' House at Bordeaux are manifold. First, the relation between the two on the basis of diagrams was suggested by Anthony Vidler, who has been one of the most consistent figures contributing to the contemporary discussions on architectural diagrams, with his writings as well as his doctoral dissertation. Second, the work of both architects promise a rich discourse related with the idea of diagrams. Despite the nature of his work negating efforts of classification, Koolhaas' name is repeatedly mentioned in relation to what its critics call diagram architecture. Le Corbusier's name on the other hand, can be associated with any suggested meaning of the word diagram from his sketchbooks and analytic drawings to ideograms, from his spatial abstractions to diagrammatic buildings. Third, both buildings can be seen as diagrammatic works in that they embody and represent ideas setting the paradigm of their respective times. As widely known and discussed buildings, they both set good examples for the definition and the study of architectural precedent and furthermore, their historical positions allow observing Villa Savoye's impact on House at Bordeaux as precedent.

By nature, a comparison dwells on similarities as well as differences, and the comparison of this study was no exception. On the one hand Savoye and Bordeaux houses can be claimed to show similarities in their generic form (as rectangular boxes elevated above ground), in instrumentalizing the idea of movement as their conceptual departing point and in their retreat to symbolism. On the other hand they can be claimed to differ in spatial organization, formal and conceptual articulation. It can be suggested the diagrams employed in the analysis were effective in achieving a sustainable communication by deepening the arguments and helping to elaborate the link between the two buildings. They were also influential in tracing the way back from the built form to concepts, which is a valuable exercise for revealing possibilities about how ideas can be translated into building, as well as from one building to the other.

Perhaps one should turn to Le Corbusier's diagrammatic analysis of his own building for a brief lesson on diagrams, which also may aid in the discussion of the findings of this comparative study. During one of the sessions of the Argentine lectures later published in his *Precisions*, Le Corbusier was able to express the governing ideas behind Villa Savoye in a few quick strokes of charcoal (figure 3.2). As concise graphic expressions of lines, symbols, dots and words, the set of drawings were effective in communicating many aspects of the building, such as the context (the location of the building in the lawn reached after a drive among the woods and its opening to the view towards north), formal composition (a rectangular box with continuous fenestration along its façade that is hovering in the air elevated on pilotis), spatial allocation (cars driving under the building to either park or drive off, distribution of spaces around the hanging garden and the provision of solarium on the roof enclosed by curvilinear partitions), structure (pilotis and its corresponding pattern on the grid), and movement (pedestrian and vehicular circulation in, under and around the building). These drawings employ varying techniques from plan and section to perspective projection

and although it can be argued that some drawings embody more information that renders them close to the definition of a conceptual diagram (the section for instance), they convey their messages in a collaborative manner, substituting a full presentation of scaled architectural drawings. Following Vidler's line of thought, it is possible to suggest that these are the abstractions (diagrams) of abstractions (drawings) of abstractions (abstract space).

In his "Analyzing Architecture through Drawing", Simon Unwin discusses that there are three distinctive ways in which drawing is presented in architectural literature: as a tool for design, communication and analysis.²¹³ However, as Unwin suggests, the boundaries between these fields are not precisely drawn; analysis can be part of design and communication activities while communication (with others and oneself) can be vital in design. What matters is the fact that drawing (as an activity and form of thinking rather than an artifact) is indispensable for the discipline of architecture. It is especially important in acquisition of knowledge and understanding (mostly through the study of precedents). While it is possible to claim that there is a threshold in transition from design to building, and an analytical effort would trace the way back to design through the same threshold, Unwin contends that "all are roaming and interacting simultaneously on the same arena", which is drawing.²¹⁴ In this perspective, it becomes clear that drawing is not a passive activity oscillating between ideas and built form, but the field where they interact and interfuse. Its potential, as well as its limitations and shortcomings are reflected on all. Vidler probably was departing from this point when he

²¹³ Simon Unwin, "Analyzing Architecture through Drawing," *Building Research & Information* 35(1) (2007): 101-110.

²¹⁴ Ibid., 109.

discussed that the abstract drawing techniques informed the built form of the modernist avant-gardes.²¹⁵

This aspect of architectural drawing should be the key to understanding the nature of how diagrams work as tools related with the faculty of memory. Most designers will submit the fact that their experience of the built environment is an important factor nurturing their designing abilities and skills, and will underline the vitality of studying existing examples. In addition to the examples and statements reviewed in this study²¹⁶, Unwin for instance, refers to architects as diverse as A. Stratton, F. Ching, R. Piano and P. Zumthor, who in different ways emphasize the significance of accumulation of knowledge and understanding through studying existing examples for architects.²¹⁷ Lawson was departing from a similar position when he was arguing about the establishment of a vast pool of precedents.²¹⁸ Although the quantity of encounters with precedents will affect one's experience, it will not be correct to claim that the more one travels and consults publications in search of spatial experience, the more he or she is likely to become a skilful designer. The number of encounters with existing examples matters in so far as one internalizes their essence towards acquisition of knowledge and understanding. The key to that kind of internalization for the designers is the drawing. Diagrams not only aid in focusing on conceptual issues and revealing the essence of things, but also in overcoming the practical difficulties of studying, drafting and storing detailed and scaled architectural drawings.

²¹⁵ Anthony Vidler, "Diagrams of Diagrams: Architectural Abstraction and Modern Representation". See section 2.2 of this study titled "Diagram as Absence".

²¹⁶ See section 2.3 of this study titled "Diagram and Precedence".

²¹⁷ Simon Unwin, "Analyzing Architecture through Drawing", 104. According to Unwin, Stratton underlined the importance of accumulation of historical references for modified use; Ching stressed an accumulation towards acquisition of a language; Piano emphasized the need for personal experience of the built environment; and Zumthor pointed at the vitality of the accumulation of knowledge through architectural history.

²¹⁸ See section 2.3 of this study titled "Diagram and Precedence".

In this perspective it becomes possible to understand that Le Corbusier's iconoclasm as well as his acknowledgement as one of the most significant figures of architectural history and the accumulation of his perception of the world in his sketchbooks is not a matter of coincidence. In contrast to his talent in drawing, most of his rapid sketches contained in these records are surprisingly poor in terms of pictorial representation. This is mostly because rather than recording things as they appeared to the eye, his attempt was aimed at capturing the essence and governing principles behind the buildings as well as other objects and beings he observed and which he internalized through the medium of drawing. He is reported to repeatedly return to and consult those drawings in search of contemplation and inspiration.²¹⁹

Similarly, it would be possible to account for Koolhaas' iconoclasm and popularity in his attempt of understanding the underlying principles and complex mechanisms of today's world. In a conversation Koolhaas declares that the motivation behind his acceptance of the position offered at the Harvard Graduate School is research, not teaching.²²⁰ Naturally, the scale of globalization and the booming of information technologies require development of new tools or adjustment of existing ones used in the acquisition of knowledge and understanding of the world which would be reflected in architectural production. Koolhaas' involvement with the contemporary diagram discourses and his recent "Ultimate Atlas for the 21st Century" should be seen as an attempt to reveal the underlining themes, patterns and systems in this emergence of a new world.²²¹

²¹⁹ For a related study see the chapter titled "The Lessons of Drawing for Le Corbusier" in Iain Fraser and Rod Henmi, *Envisioning Architecture, an Analysis of Drawing*, 1-21.

²²⁰ Part of these research activities is published separately. See Chuihua Judy Chung (Ed.), *Great Leap Forward / Harvard Design School Project on the City*, (Taschen, 2002); Chuihua Judy Chung (Ed.), *The Harvard Design School Guide to Shopping / Harvard Design School Project on the City 2*, (Taschen, 2002).

²²¹ The popular computer technology magazine, *Wired*, hosted Rem Koolhaas as the guest editor of its June 2003 issue to present his "Ultimate Atlas for the 21st Century". The Atlas opens with Koolhaas' quasi-manifesto that is accompanied by the visions of "a cadre of writers, researchers,

Thus, designers' schema does not only involve techniques and procedures of design activities, but the acquisition of knowledge and understanding of the world that surrounds them. It was in this context that Gombrich's inquiry into the psychology of pictorial representation was imported into this study and its relevance lies in the fact that Gombrich displays artists' dependence on schema (a model or formula to be inherited from previous generations) and its relation to diagrams (study of existing examples which at certain times took the form of patternbooks).²²² Artists' schemata do not provide them with the knowledge and ability to depict how things appear in the world, but with a model through which they can acquire an inner knowledge and understanding of the structure and essence of things that are hidden underneath the surface. Only by building on this model through constant changes and repetitions, artists can develop their own ways of representing the world as they see it. Dependence on a model inherited from previous generations does not block the way to innovation and creativity. Contrarily, by providing a strong foundation and rigor, it serves as a spring-board and a yardstick to proclaim a leap-forward.

Although architectural representation differs from pictorial representation in many ways, it is possible to observe similarities between the coupling of schemata and diagrams in both contexts. An initial (as well as naïve and literal) argument would suggest similarities between the patternbooks of

critics and artists" who had been invited "to report on the world as they see it". Koolhaas declares that "our old ideas about space have exploded" and "entirely new spatial conditions, demanding new definitions have emerged". What follows his quasi-manifesto is a mapping of 30 spaces in the form of essays varying in length, accompanied by photographs, charts, graphs, maps and digital images. Resembling the liquidation of the conventional borders as an effect of a globalization gone wild, the mappings of the spaces blend into one another to display quite a dark image of the world we are living in. However, rather than a total catastrophic image, Koolhaas' Atlas tries to give us a picture of the world as it is (Vidler writes "it represents the here and now with hyper-objectivity"), that is resonating in a strong sense of irony. See Rem Koolhaas, "The New World: 30 Spaces for the 21st Century", [INTERNET, WWW], ADDRESS: <http://www.wired.com/wired/archive/11.06/newworld.html> [last accessed September 4, 2007]

²²² See section 2.3 of this study titled "Diagram and Precedence".

artists and portfolios of architects. Upon further scrutiny, in the context of architecture, it can be claimed that schemata is more related with regularizing the way diagrams are implemented than with the mere repetition of diagrams themselves. Through education and practice, architects acquire an inner knowledge and understanding of space, form, structure and order through drawing as a way of thinking, which in turn is reflected in their activities from communication to analysis and to design.

When Le Corbusier was analyzing Villa Savoye with the help of diagrams before the audience (figure 3.2), he was communicating as well as reflecting on his own the ideas behind the building. These were drawings composed of quick and seemingly irregular strokes, but they were not arbitrarily chosen and drawn. They contained information about the context, formal composition, spatial organization, structure and circulation.

When Rowe was comparing Palladio and Le Corbusier, his motivation was revealing the timeless elements of the link between their buildings to cross over centuries, rather than revealing clues of likeness of physical appearance. The strength of his comparison was built on the analogy between the structural systems of the buildings, however, he was able to sustain his analysis by dwelling on the context of the buildings, as well as their formal and structural articulation and spatial organization.

The comparative analysis of this study aimed at constructing a framework that would allow the observation of diagrams' role as mnemonic tools and its comparison was articulated through a similar discourse on the context, structure, formal composition, spatial organization and movement. To repeat, the diagrams employed in the analysis were helpful in sustaining the dialogue between the buildings by deepening the arguments and helping to articulate the suggested link. They were also helpful in tracing the way back from the built form to concepts, which can be regarded as a

valuable exercise for revealing possibilities about how ideas can be translated into building, as well as from one building to the other.

Understanding diagrams' role as mnemonic tools requires acquiring knowledge on architects' schemata and regarding drawing as a form of thinking rather than mere artifact. That would also help to account for the contemporary discussions regarding the idea of diagrams that understand society in its "socio-political plasticity" and that elevate the design process above formal concerns.

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