
“THE MEANING OF ORGANIC ARCHITECTURE IN THE CONTEXT OF THE EMERGENCE OF MODERNISM”

WITH PARTICULAR REFERENCE TO THE WORK OF WRIGHT, AALTO AND
HARING

by

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A Dissertation
Submitted to the Wales Institute of Science and Art
University of Wales Trinity St David
In Partial Fulfilment of the Requirements
For the degree of BSc Architecture
May 2020

Acknowledgements

First of all, I would like to thank my Dissertation supervisor, Dr Paul Harries for his invaluable advice and guidance and support throughout the year. I would also like to thank all the members of the Architecture school for their irreplaceable efforts and advice.

Finally, I would like to extend my deepest and sincerest gratitude to my parent, who were always there for me whenever I needed them and supported me in every way they could.

Table of Contents

List of Figures	3
Abstract.....	4
Introduction.....	5
Literary Review	9
Methodology	12
Case Studies	16
Frank Lloyd Wright - Fallingwater	16
Ictinus and Callicrates - Parthenon	21
Alvar Aalto - Villa Mairea	26
Hugo Haring - Gut Garkau	31
Palladio - Villa Rotonda.....	35
Mies van der Rohe - Farnsworth House.....	38
Conclusion and discussion	41
References.....	42
Appendix.....	44
Author's Declaration	46
Copyright statement	47

List of Figures

Figure 1: Fallingwater sketch

Figure 2: Fallingwater tree detail

Figure 3: Zevi's Plan formations

Figure 4: Fallingwater plans and elevations

Figure 5: Acropolis hill with the Parthenon

Figure 6: Temple of Zeus architectural drawing

Figure 7: Parthenon architectural drawings

Figure 8: Roof ornamentation of the Parthenon

Figure 9: Site plans of the Parthenon (top), temple of Zeus (bottom)

Figure 10: Villa Mairea

Figure 11: Villa Mairea Floor plans, elevations and schedule of accommodation

Figure 12: Staircase leading to the main residence area

Figure 13: Floorplans showing the entire estate as well as the cowshed (top right) and the Farmhouse (bottom).

Figure 15: Serlio's 3 by 3 grid Poggiorealle

Figure 16: Villa Rotonda

Figure 17: Geometrical analysis of Villa Rotonda

Figure 18: Farnsworth House floorplans and Elevations

Abstract

This dissertation explores the meaning of organic architecture in the context of the emergence of modernism. Organic architecture as a term was created during recent times by Frank Lloyd Wright, who is considered the father of organic architecture. Even though its roots span all the way back to ancient times, there is no one definition to embrace all organic designs. This style of design seems to explore in depth the relationship between architecture, humans and the environment and looks for ways to make those relationships harmonious. It shows elements of Romanticism and Rationalism but most importantly Functionalism, with one of the fundamentals of organic design being that form should follow function. This however was not embraced by all architects in the Modern Movement, as there seems to be a divide across the architectural world, based on how architecture should look and be conceived one having classical elements and one having organic. The analysis is based on a set of criteria that three buildings of each category will be tested on and was created by reference to written works by scholars such as Bruno Zevi and David Pearson. The buildings that are regarded as organic architecture include Fallingwater by Frank Lloyd Wright, Villa Mairea by Alvar Aalto and Gut Garkau by Hugo Haring, The buildings that are regarded as classical and inorganic are The Parthenon by Ictinus and Callicrates, Villa Rotonda by Palladio and the Farnsworth house by Mies van der Rohe. This will test the boundaries of organic architecture by analysing buildings well-known for being critically regarded as part of the organic style of architecture and some that appear to be diametrically opposite to this category. The ambition is to find a definition that embraces all the elements of organic architecture and see how rigid its boundaries are. In the end, it has been identified that the reason why no explicit definition has been given to the term organic architecture is that it evolves with time like a true organism.

Introduction

“For some, organic architecture is curved, organic is asymmetrical, organic is natural materials, organic is individualistic, organic is holistic”. (Sidney K. Robinson, 1993)

Through the centuries, nature has always been a source of inspiration for architects as evidenced in ancient architecture and buildings designed today. An example of that is the use of natural shapes for the embellishment of structures in vernacular architecture. Leaf patterns in the capitals of Egyptian, Greek and Roman temples. Another example is the use of materiality and the location of where it was sourced. The materials used to create the structures were locally sourced, thus relating the building to its site. For instance, the marble used to make the temples in Athens came from mount Pentelicus, which is located roughly 20km to the northeast of Athens. In addition to that, civilizations such as those in Cappadocia, Turkey, used their surroundings to create buildings inside the soft rock formations, which are now known as fairy chimneys (Lam, 2017). This is also an example of how the site was integrated into the structure and blended into the landscape. Another way of distinguishing buildings as organic can be their form and function. Early and late Christian churches and temples are shaped like a cross, which is the most important symbol of the religion. Such examples can be seen in both Byzantine and Gothic temples. Moreover, these structures borrowed key elements from Roman and Greek temples as well and adapted them to their needs, consequently highlighting elements of progression and evolution. The way the rooms were placed and the orientation on the site all served a specific function. However, as far as modern organic architecture is concerned, different architects have set out to demonstrate their version of organic design displaying these basic elements of materiality, locality function and form as well as organic shape and forms in their own individualistic way.

During the 19th century, one style that displayed evidence of organic forms in architecture in Europe is Art Nouveau. Finding its roots in British Arts and Crafts in the 1880s, the ironwork of the “Entrances to the Paris Métro” by Hector Guimard and Gaudi’s architecture in Barcelona are two of the most renowned works of organic architecture. Gaudi’s (1852-1926) ideology revolved around the notions of John Ruskin (1819-1900), as suggested by J.J. Navarro Arisa in his Gaudi biography, author of the “Seven Lamps of Architecture”, and the French Gothic revivalist Viollet le Duc (1814-1879). In their works, John Ruskin and Viollet le Duc, they emphasised the use of natural shapes and materials as well as honest craftsmanship, meaning without the use of mass production machinery that was introduced during the industrial revolution. Furthermore, Gaudi adopted Ruskin’s belief in “ornament is the origin of Architecture” and used in his buildings (Zbasnik-Senegacnik & Kuzman, 2004, p293). His most noticeable works includes Casa Mila, Casa Batlló, Casa Vicens and the as yet unfinished Sagrada Familia, Barcelona’s emblem Cathedral. In Gaudi’s Casa Mila and Casa Batlló, zoomorphic elements are clearly displayed; the columns of the Casa Mila acting like the skeleton of a creature and

the rest of its elements as the flesh, and the scales-looking tiles on the façade of the Casa Batlló with a colourful dragon on the roof. In addition, Casa Vicens displays Islamic influences as well as with the florally sculpted ceilings. In the Sagrada Família Basilica, he uses light and colour to further decorate his building. The primary source of decoration comes from the use of sculptures on the building with natural shapes. Moreover, in the Basilica he empirically used catenary shapes to ensure the structural integrity of the building, by hanging weights from ropes and measuring the curves. Such curves can be seen every day with examples being the chain hanging between road posts as well as the Tyne bridges curve. By inverting the shapes he created on the vertical axis, he creates structures that would withstand loads and not collapse. As a final point, his furniture illustrates ergonomics and functionality as they were sculpted around the human form. All of this can be seen from his work displayed in the Sagrada Família and the Casa Milà exhibition spaces.

In America, Louis Sullivan's prodigy Frank Lloyd Wright (1867-1959) during the 19th-20th centuries became the first person to use the term "organic" to describe his design principles and came to be known as the father of organic architecture (Pearson, 2001, p. 39). Wright took the idea of "Form follows Function" from Sullivan and combined it with elements from Japanese architecture and Viollet le Duc's teachings (Hoffman, 1969, p. 173-183). Similarly, to Japanese architecture, Wright's designs display harmony, unity, and simplicity and are respectful to nature and materiality, making each mark unique. He is the architect of the Kaufman residence "Fallingwater" in Pennsylvania, Taliesin West in Arizona and the Robie House as well as many more. Wright, through his architecture, is blurring the boundaries between the exterior and the interior of the building with the use of materiality and proportionality and introduced the idea of making "Form and function work as one". (Wright, 1953) In his design, he pioneered the Prairie style which incorporated low pitched roofs, cantilevers, a central chimney and open floorplans which he saw as the antidote against the closed up Victorian design as suggested by Klinkowitz in his book (Klinkowitz, 2014, p.20). This meant that one room could have many functions like in modern houses today, where for example the living room, dining room and kitchen are all together in an open plan.

The above are only a few examples of architects whose design philosophy is informed by the idea of creating organic architecture. Many more architects adhere to these organic principles, including, Hunderwasser, Renzo Piano, Alvar Aalto, Jorn Utzon, Calatrava and Zaha Hadid with their career spanning from then till today. They all represent different organic elements and ideas in their designs based on their views of architecture. Zaha Hadid's parabolic and curved structures, Aalto's organic shapes and use of natural materials such as timber and placement on the landscape are two examples of how they are displayed.

However, more recently modern organic architecture has taken a turn towards sustainable design and the response to its environment. For instance, biomimicry, which provides smart design

features and technologies as well as high performance appliances, that enable buildings to respond better to the building needs based on the environment. The building reacts to its environment like a living organism, though, architects such as Chris Precht in Germany as well as companies such as Amazon with their headquarters in Seattle (Amazon spheres) have shifted in using a biophyllic design approach as well, which includes the extensive use of plants indoors to promote sustainable design as well as user's wellbeing. It can be used to reuse grey water, provide shading for the building as well as filtration to the air in the interior. This brings us closer to the Frank Lloyd Wright approach to architecture, where he believed in the relationship between the exterior and the interior.

According to the Italian architect Bruno Zevi, not all architecture is organic. Zevi in his book "Towards an organic architecture" gives an example of the two types of construction philosophy two peasants chose to build their house, one living in America and one in Europe. The American option is to make a room and add around it based on his needs, progressively almost resembling natural growth without vain purposeless ornamentation. The building therefore develops and grows as the needs of the owner in a shape not predetermined for its exterior beauty but for its function for the occupant, thus "form follows function". The European choice is to create a basic geometric room larger than he needs and divides it into rooms adding to it as his family grows. This design is restricting, inorganic, and classical. In architectural terms, this gives the notion to styles such as Renaissance, Palladianism, Rococo, Baroque as well as Greek revival, Neoclassicism and the Beaux-arts. Classical buildings have elements of proportion and symmetry, with visible repetition of elements and use of orders that refer back to classical Greek and Roman architecture. In addition to that, Zevi refers to the Churchill houses that can be found around Britain. This term refer to the mass produced houses that can be found around the UK one next to the other, and looking identical. These mass production houses, do not respond to the environment nor to the specific needs of their clients but made to meet "artificial standards" (Zevi, 1950, p 72). This is an example of inorganic design. Peter Blundell Jones in his book suggests that such designers include Peter Behrens, Walter Gropius, Mies van der Rohe and Le Corbusier are examples of in-organic approach. Zevi argues however, that prefabrication can be made in a more organic manner as well. He looked at the example of Sweden and America, where each room in prefabricated and the client connects them according to his needs.

Per contra to this division between organic and inorganic design and categorization of architects there seems to not be a rigid line between the two. An example to that is the work of Le Corbusier. Historians such as Zevi characterise his design as functionalist; that his buildings forms derive from their function. Le Corbusier introduced the Dom-Ino Style; it is a grid with columns, a structure raised on pilotis, which allowed the free placement of walls, as indicated in his well-known villa Savoye in Poissy, which has curved and orthogonal walls and an asymmetric plan. It however does not grow out of the site and demonstrates repetitive patterns on its elevations with the use of windows and columns.

Consequently, the aim of this dissertation is to test how rigid the line between organic and inorganic, classical architecture is through the analysis of six buildings, three of which display organic tendencies and three buildings that are regarded as displaying classical/ rationalist tendencies. They will be tested on a set list of criteria made by combining various elements of the research made during the dissertation process and displayed in the methodology section.

As far as the structure of the dissertation is concerned, it is set out with literature review, methodology and after that, the analysis of how the buildings relate to the set of criteria created as well as the results and conclusion.

The referencing format that this dissertation follows is the one set out by Harvard University. In addition, all the charts can be found in the beginning of the dissertation.

Literary Review

Initial research on this topic was made using the library resources available and, reading through various research papers that were written on the topic of Organic Architecture as well as books, peer reviewed articles and, journals.

During the 1920s, a shift away traditional building forms and construction processes became noticeable. One of the approach that evolved through this shift and, is at the centre of the so-called Modern Movement period is called Organic Architecture. The basis for the creation of this movement came from earlier with influential Architects such as Ruskin and Violett le Duc in the 19th century who were inspired by natural shapes and processes. Frank Lloyd Wright(1867-1959) was the first person to use the phrase organic architecture and describe his work that way. He studied under Louis Sullivan, who believed that “Form follows Function”. As far as the definition of what Organic architecture is, Wright failed to give a definitive answer, however his main principals can be seen and interpreted throughout his work such as Robbie House and Fallingwater. In addition to that, in his essay titled “the New Architecture: Principles” he introduced nine principles that informed his architecture. They address the relationship between man and nature through themes such as nature, form and function, romance, ornament, spirit, site and the third dimension. These will be discussed further in the main body of the dissertation.

‘Towards an Organic architecture’ by the Italian Architect and Historian Bruno Zevi sets out a basis to better understand what organic architecture entails. He refers to the works of Frank Lloyd Wright as well as the well renowned German architect W. Behrendt, in order to create a list that proposes what makes architecture organic and what does not, presenting it as “Behrendt’s Account” (refer to appendix 1). Zevi, being one of the most influential European supporter of Frank Lloyd Wright, as he is mentioned in an abundance of literary works that follow the work of FLW, gives great insight to his work. Some of those being the books of David Pearson, Peter Blundell Jones and historian Hitchcock. Great emphasis should be given on the intermediate chapter (Zevi, 1950, p66), where he discussed what is the meaning of organic, in terms of architecture, without giving it a closed ended interpretation, but in reality by discussing the different perspectives and views of other architects of that time as well as Wright’s, Aalto’s and Behrendt’s.

Similar to that is the work of architect and planner David Pearson in his book called ‘New Organic architecture: The Breaking Wave’. He also refers to the work of Frank Lloyd Wright and some other architects with similar designing methods, and created the “Gaia Charter” (refer to appendix 2). It is similar to the list mentioned create by Bruno Zevi “Behrendt’s Account”. He however introduced a modern twist to his list, which is discussed further on.

For both authors, characteristics of organic architecture are defined. Those include the shape of the building, how it “unfolds like an organism” (Pearson, 2001, p.72), its form, sustainability, free from geometry, dynamic, irregular adaptable and flexible, its relation to the site. Sustainability is something very important for modern day organic architecture, which is what Pearson added to that list.

Following these and adding to them, Zehra Kuz and Deborah Gans make reference to the plasticity of a building and connect it to Frank Lloyd Wright as well. Their book includes a transcript of a symposium called “Evolution and lines of Descent”, where many acknowledged architects from around the world took place, including Kenneth Frampton. They give an alternative biological approach to organic architecture. They explain that according to Wright, the term refers to the nature of the building itself as a physical existence and its nature (Kuz, xii) and used Wrights quote “expressive flesh covering the skeleton as contrasted with the articulation of the skeleton itself” (Kuz, p xiii). This brings us back to the case of Gaudi’s architecture in Casa Mila as discussed in the Introduction. The Authors in addition, continue to analyse other architects that express their architecture in an organic manner; these include Alvar Aalto and Hugo Haring.

Alvar Aalto (1898-1976), is a Finnish architect that played an important role in the Modern movement. With is placid approach to manipulate and shape light, materials and forms in a building made him internationally accredited and his work to shape Scandinavian design and to continue to influence young generations today. As far as Aalto is concerned, the authors introduced his concept of biodynamic design where he interprets a home a shelter that its shape is dictated by function and not symmetry (Kuz, p.39) and distinguished between huone and tupa. A huone is a room that has only one fuction like in the Victorian model, whereas a tupa refers to the modern approach to interior design, meaning a single multifunctional room. This relates to Frank Looyds Wright’s Prairie style mentioned earlier. Reading on the “The Alvar Aalto Guide” by Michael Trencher, in his chapter on Aalto and modern art we get a deeper understanding on how he got involved in this type of style better. He refers to the CIAM, which is the Congress of International Architectural Modernism founded by Le Corbusier, in which movements like de Stijl and Bauhaus belonged. Some of the main ideas behind it was the rejection of history, tradition and natural processes, which would become obsolete due to industrialization and manufacturing. However, Bauhaus architect Moholy –Nagy’s book “Material to architecture” (1927) pioneers and leans away that way of designing, introducing the biological aspect to design and acknowledging tradition as well. This as one of the spurs that aided in the creation of his unique style of combining Finnish traditional architecture with modernism. From then on and especially in the 30s we see a flourishing new and individualistic architecture which according to Kuz, its process and the form grows naturally and “unmediated” by reason which can be also indicated by his studies of materials such as timber (Kuz, p.64). This circles back to Sullivan’s and Wrights idea of “Form follows function”.

Hugo Haring was a German architect (1882-1958) best known for his writings on organic architecture and the design of Gut Garkau farm in Germany (1925). He has undeniably assisted in shaping the Modern Movement in the 20th century. However, as Peter Blundell Jones in his book *Hugo Häring: The Organic Versus the Geometric* states: “he believed that his masterpiece was nothing grander than a cowshed” (Jones, 1999, p. 8). His innovative work revolved around Functionalism and referred to his architecture as “*Neues Bauen*” meaning “New Building”, as the word “architecture” correlates with the classical Latin culture, which he did not, identified with. He was highly influenced by Theodor Fischer who was thought to be the father of European Organic Modernism as he pursued the “*specific*” and not the universal like Gropius, Mies van der Rohe and Le Corbusier” (Jones, 1999, p. 9). Theodor Fischer was a German architect of the 19th century that during his time as a lecturer he taught famous architects such as Bruno Taut and Hugo Haring. Likewise, with Aalto and Wright, he states that: “the form of purpose finds its shape naturally [...] the form of expression depends on the physiological use of geometry” (Kuz, 2003, p. xxii). In addition, he believed in a symbiosis between nature and the *Neues Bauen*, meaning a harmonious coexistence. His 15 years junior Hans Scharoun becomes a critical figure in understanding further Haring’s work. He describes it as a zoomorphic element like Aalto, but using the term “*Organswerk*” (Kuz, 2003, p. 29) he describes the structure as a plant that orientates itself towards the sun in a manner beneficial to it and that materials and spaces collectively define the use of spaces. This for him also meant that this organism like structure was dynamic, always evolving by nature and not static flooding with youthfulness (Kuz, 2003, p. 30).

As a result from individuals such as Haring, Wright and Aalto, organic architecture has progressed its roots and basis to develop even further without however setting hard boundaries and limitations neither producing one interpretation.

Methodology

Through the research made during the process of the dissertation, it was intriguing to realize that there is not only one definition for what constitutes this huge branch of Architecture, as different people attribute it a new meaning depending on what their views are. As a result, this assisted in creating sufficient background knowledge, focusing on this topic, which in turn helped me create an initial research plan. This in turn included studying those architects that espouse organic architecture and, what their views and theories are. I also examined on how they implemented their ideas on their buildings. This process allowed me to offer my own interpretation of organic architecture as a conclusion.

The research methods used to create this dissertation are a combination of analyzing secondary research from books and, peer review articles as well as looking into case studies of different buildings created by architects whose works are generally regarded as being embraced by the term of Organic Architecture. This method was chosen as a result of analyzing papers of similar processes and methodologies as they offered clarity and ease of understanding for the reader to follow the stream of information given to them.

Furthermore, these research methods have their own advantages and, disadvantages. For instance, when reaching through qualitative data (articles, journals, books etc.), the process can be very time consuming and, the finding efforts can be repetitive and, the breakthroughs small. In addition, the subject doing research most of the time has little knowledge on the subject. However, this repetition can help with minimizing the human error, meaning using findings based on bias and, subjectivity. This means that, while reading through different sources of the same subject, the chances of using bias material in the dissertation will be minimized. The reason being, that the evidence provided in it are sourced from multiple sources written by various accredited authors. In addition the structure of the research is quite fluid meaning that different angles can be researched at the same time, which could allow for better time management. Case studies on the other hand, as conducted within the context of their use, which in this case where buildings will be analysed, compared and, contrasted, it will be beneficial, as they will offer examples to base each argument on. In addition, the number of variables is limited and, they can also draw in information from peer-reviewed article and, journals to further strengthen them as well as be applied in real life much like in this situation. However, they must be done with caution as not to be perceived as not rigorous in order to allow them to be influenced from a set direction to produce certain conclusions.

More specifically, after reading through the work of people such as Bruno Zevi, Peter Blundell Jones, it was understood, that there is a theme that all architects that espouse organic elements in their

designs have commonalities. Both historians share a passion for Organic architecture and this can be understood from their books “Towards Organic Architecture” and “Hugo Häring: The Organic Versus the Geometric” respectively. In both books, the authors create a list of what elements based on the architects they have studied, they think makes architecture and buildings Organic and what does not. On one hand, Bruno Zevi breaks them up into Organic Architecture and Inorganic (Zevi, 1950 p. 69), whereas P B Jones into two schools, those of Modernism and those of Classicism. Ultimately, however, they both reach the conclusion that classicism is not Organic. This is also something that Historian Kenneth Frampton also advocates in the book “The Organic Approach to Architecture” by Debora Gans and Zehra Kuz. In his panel presentation titled “Organic Organ-i-city”, he writes about the Tobias Faber-Jorn Utzon initiative to photograph a collection of their buildings and attempted to compare their form from nature and vernacular architecture. Indeed, they found 11 out of 28 containing forms derived from nature such as crystals, and flora and fauna as well as 5 influenced by Wright and others from vernacular Scandinavian design. He further explains that this return to the vernacular influences is not strange to modern architecture as architects such as Phillip Webb sought to incorporate vernacular architecture in his designs and in English architecture in general. Phillip Webb pioneered in the Arts and Crafts Movements in England and the Red House (1895) is one of his most famous projects. He believed that the vernacular design has a functionalistic, and traditional approach, something that was lost in the Victorian design. He however realized that these qualities were lost in the Classical buildings of that time from the Neoclassical Movement and Gothic revival. (Gans and Kuz, 2003, p. 165) In addition to that English based architect David Pearson, in his book “New Organic Architecture: The Breaking Wave”, he discusses the “Gaia Chapter” which are a set of criteria that adhere to organic architecture. They were first introduced in his first Book “The New Natural House Book”, which was originally published in 1989. What was very important about his ‘Gaia Chapter’ is that he also introduced the theme of sustainable design, which neither of the previous mentioned authors had. More specifically, he states: *“Let the design be inspired by nature and be sustainable, healthy, conserving and diverse”*. (Pearson, 2001, p72)

Finally, the book that mostly inspired the course of analysis of the subject matter was “The Historiography of Modern Architecture” by Panagiotis Tournikiotis, a Greek architect and lecturer at the University of Athens. What is discussed in the book is the aim of making history while taking reference to different architectural styles and architectural historians such as Hitchcock and Bruno Zevi, and how they have influenced each other respectively. In order to achieve that, he uses the principles of Leon Battista Alberti, a Renaissance author that took interest in Architecture; necessity, commodity and delight. Even though Alberti’s architecture opposes organic design and the context of mr. Tournikiotis isn’t relevant to this dissertation, his methodology is. By using these principles as criteria, he made the context of the book easy to follow and to understand which resulted to the reader to arrive to the same conclusion with the author.

Taking this into consideration, the most appropriate route in order to respond to this subject seemed to be the creation of a number of Criteria in which both Organic as well as Classical, “Inorganic”, buildings could be assessed. They will be created by combining the ones that the authors above have mentioned in their works in addition to taking into consideration the beliefs and views of the architects that design in the field of Organic Architecture.

From researching Organic Architects, numerous names came up. From Frank Lloyd Wright, Louis Sullivan, Alvar Aalto, Hugo Häring, Scharoun and Theodor Fisher, to Antonio Gaudi, Hundertwasser, Enric Miralles and Carme Pinós. On the other hand, Architects such as Mies van der Rohe, Walter Gropius, Peter Behrens and Andrea Palladio created buildings that oppose the principals of Organic Architecture and follow the Classical principals. All these Architects have created buildings that have influenced generations of architects.

In the following chapter, some of the buildings designed by the architects mentioned above will be analysed and assessed under the list of criteria created from the guidelines and principles mentioned above. Examples of these include Fallingwater by F L Wright, Villa Mairea by Alvar Aalto and Casa Milla by Antonio Gaudi from the Organic side. From the inorganic side, Farnsworth House by Mies van der Rohe, Villa Rotonda by Palladio and the Parthenon by Ictinus and Callicrates. The reason behind examining buildings that belong to architects that embrace either the Modern Organic or the Classic Inorganic architectural style is that from the research done, it was observed, that the boundaries of Organic and Inorganic are blurred and not rigid, as they may have seemed in the beginning. As a result, the decision to try to analyse as well as put them under the criteria and judge these three buildings most known for their inorganic, geometric and classical nature was made, to further challenge the boundaries of these two sides. As a conclusion from these efforts would be to provide a better understanding of the world of organic architecture as well as further support an already existing interpretation, or bring a new one to light.

In order to analyse the organic qualities of buildings, a set of criteria based on various definitions were framed based on the findings from reading the above texts, especially the tables in the chart section made by Zevi and Pearson. Common themes were noticed between all of them; Honesty and Integrity in the design, Site – Building and Form - Function relationships, Nature, Peacefulness and Uniqueness. All the criteria and views were compared as mention previously and condensed into this list:

1. It should be a product of the relationship between form and function and not a product of a preconceived formal system.
2. The structure should unfold like an organism & be in harmony with the environment. It should be in close contact with nature, “grow out of the site”, be unique
3. It should have dynamic forms and not be static
4. Be inspired by nature, be sustainable, healthy, conserving

5. Satisfy social, physical, spiritual needs.
6. It should be a product of common sense (creative architecture) and be of reasonable duty. It should not try to achieve absolute perfection and proportion. It should be thus a product of intuitive sensation & imagination.
7. It should celebrate the spirit of youth and play.

Case Studies

Frank Lloyd Wright - Fallingwater

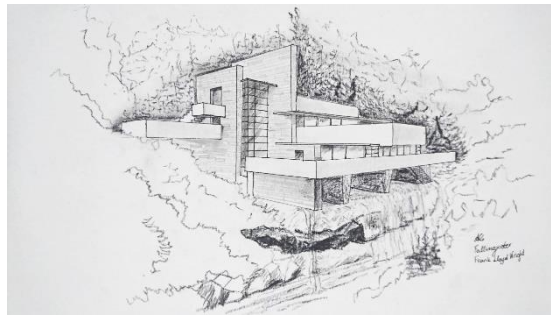


Figure 1: Fallingwater sketch (sketch from my notebook)

Pre-eminent architectural masterpiece of the acclaimed Architect Frank Lloyd Wright, Fallingwater, or as its original name Kaufman House, in Mill Run Pennsylvania was built in 1936. Mr. and Mrs. Kaufman commissioned Wright to design them a house near the stream of Bear Run, which had been the weekend retreat for more than 15 years with the waterfall being their favourite spot. The architectural analysis of this building is presented below and in response to the criteria, and whether or not it satisfies them.

1. It should be a product of the relationship between form and function and not a product of a preconceived formal system

His vision for the house was not to have form follow function but to have them work as one. Rejecting the traditional construction of enclosed spaces, as suggested by the Aalto huone type houses, he opened them up. This would introduce a new set of freedoms into the space. An example to that is the glass hatch built to slide in order to access the staircase that leads to the river's edge from the living room. As seen from the plans, there is no apparent structural grid like in classical architecture. It however looks like an initial rectangular space that according to his design intent and client needs, spaces sprouted around it. This in result also meant that each space transitions to the other flawlessly and smoothly.



Figure 2: Fallingwater tree detail (https://commons.wikimedia.org/wiki/File:Frank_Lloyd_Wright_-_Fallingwater_exterior_6.JPG) Accessed at 20/5/2020

2. The structure should unfold like an organism & be in harmony with the environment. It should be in close contact with nature, “grow out of the site”, be unique

Its relation to the site through its position, orientation and materiality provoke a sense of harmony with the environment. After visiting the site for the first time, the architect requested the contour map of the site with every boulder and large tree designated on it (Hoffmann, p13). In his mind, Fallingwater would complement the site, working with it rather than intruding into it. One peculiar element that perfectly highlights that is the way the beam of the canopy curves around the tree as indicated in (figure 2). The cantilevers, such a prominent feature, according to him already exist everywhere on the site; rock edges as well as on the leaves of the laurel and the rhododendron. As a result, Wright saw the cantilevers as a natural principle. Furthermore, they also provided a sense of rhythm and harmony with the site as well as architectural freedom. In addition, the combination of materiality and simplicity indoors blurred the boundaries between interior and exterior. The red window frames in the kitchen directed the eye towards the outdoor. In addition, Wright designed built in furniture for the House to promote unity between the structure and its interior decor. Another element that shows the importance of unity is the horizontal lines; from the cantilevers all the way to the windows and the custom made furniture. Finally, the plan itself seems to be extending outwards towards the outside from various directions, as the main living area as seen on figure 4. This relates to the two forms of constructions that Zevi discussed on the European and American system. (Figure 3)

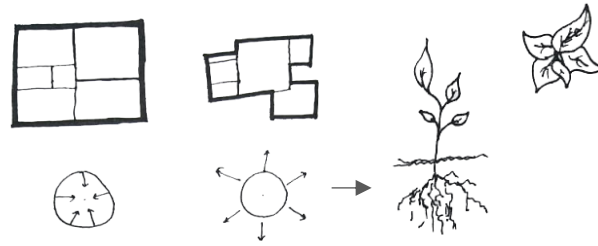


Figure 3: Zevi's Plan formations (sketches from my notebook)

3. It should have dynamic forms and not be static

In conjunction to what is stated above, its position on the site and its structural elements give the impression that it grows out of the site, which ultimately give a sense of dynamism and movement. As seen in the elevations on Figure 3 it seems, as the stone vertical walls are a continuation of the waterfall cliff or those they are mirroring the trees surrounding them. In addition, as the viewer approaches the building, he is presented with a multiplane of construction elements such as the cantilevers that come in many shapes and sizes as well and the waterfall running down.

4. Be inspired by nature, be sustainable, healthy, conserving

As far as the construction materials are concerned, for Wright, each material had a different quality. Wood is sturdy yet flexible, Glass is transparent and allows light to filter through the house, concrete is fluid and lastly bricks and stone that are rigid. It is also important to notice that Wright was against abusing the materials and maintain them in their natural form, thus he did not paint the timber and the concrete was poured insitu as in Unity Temple. Furthermore, the colour palette that is featured in Fallingwater consist mainly from tan, dark olive green, dark khaki as well as dark brown and cherokee red which all contribute to the earthy interior environment. In addition, the materials used were sourced locally, which nowadays is considered as one of the most important steps for obtaining sustainable materials as the carbon footprint for transportation will be low. In addition, this method brings the build closer to the site. Even though in Modern day construction, sustainable and conserving design has a different meaning as mentioned earlier, it can be said that Fallingwater was and continuous to be an example of architecture that was inspired by nature and strived towards conserving it through the examples mentioned.

5. Satisfy social, physical, spiritual needs.

The client, thinking that Frank Lloyd Wright would design them a house with views out to the stream and waterfall, he instead designed them a house in such a way that it appears as the water flows beneath the house. Wright, used the clients vision for the site and took it a step further. By making the waterfall part of the design, it meant that it could be part of their everyday life, as the sound of the water passing

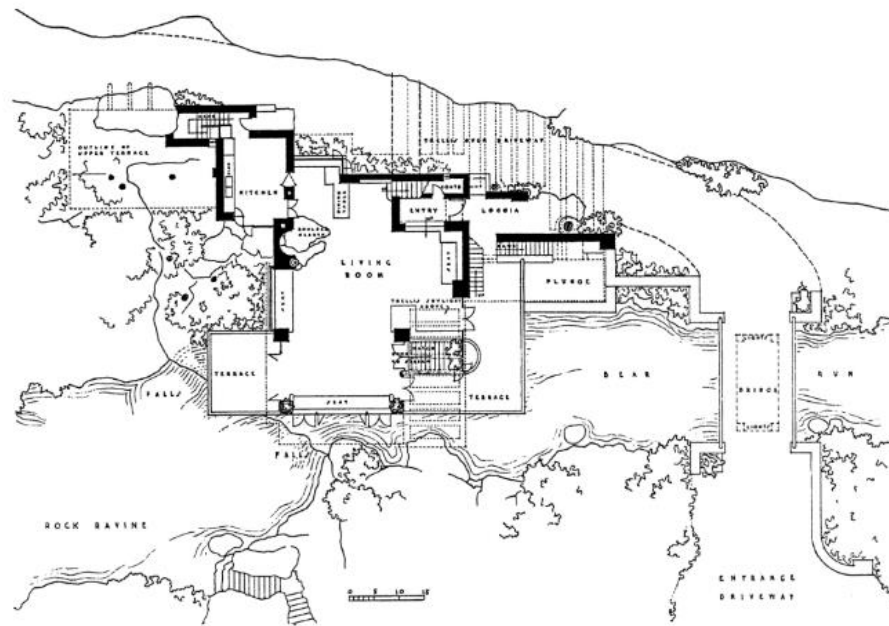
by the house echoes in the entire house. The house was created as a weekend getaway and this further extenuated the tranquility the space would provide to them.

- 6. It should be a product of common sense (creative architecture) and be of reasonable duty. It should not try to achieve absolute perfection and proportion. It should be a product of intuitive sensation & imagination**

Looking at the architectural drawings, it can be understood, that Wright didn't design Fallingwater passed on geometry and proportionality, he instead designed a floorplan that is leaning towards functionalism and the way he thought the Kaufmann family would be able to experience the house better. Entering the house, the visitor is welcomed in the small foyer, which opens up to his left into the enormous living space. From there, the dining space can be seen as well as the gorgeous views to the outside. The dining area has the stairs leading to the upstairs and the closed kitchen on either side. On the first and second floor, the sleeping quarters are located, separating thus the family from the personal spaces. One element that connects the floors together is the central fireplace that is a characteristic feature of the architect's designs.

- 7. It should celebrate the spirit of youth and play.**

To conclude, all of the design elements used in Fallingwater fit the criteria set above, constituting it as a perfect example of organic architecture. Its shape indicates a sense of playfulness and dynamism, where it looks like it grows out of the site through its relationship to the waterfall and the use of cantilevers. Furthermore, the organisation and flow through the space and how they dictate the form of the building. It responds to the functional needs of the building as well as the clients; it is the perfect example of his "form follows function" relationship established by the architect. Using all of the architectural elements mentioned above, this building indeed celebrates the real. From the way that the building relates to the waterfall, to how Frank Lloyd Wright established the use of cantilevers as well as the elements mentioned above that indicated a strong connection with the site, making seem as growing out of the site showed youthfulness and play.



ABOVE: 14. Plan of first floor.

BELOW: 15. Plans of second and third floors, with elevations.

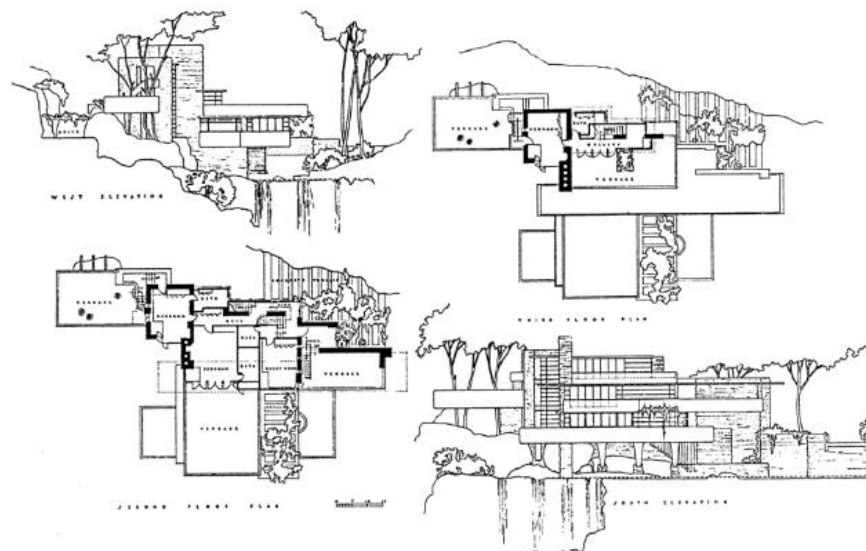


Figure 4: Fallingwater plans and elevations (Hoffman, D., 1985. *FLW Fallingwater: The House And Its History*. 2nd ed. Massachusetts: Peter Smith Pub Incorporated, p.20)

Ictinus and Callicrates - Parthenon



Figure 5: Acropolis hill with the Parthenon (<https://www.greeka.com/attica/athens/neighbourhoods/acropolis/>) Accessed at 10/3/2020

The Parthenon (447-432 B.C.) with its monumental presence in the Athenian skyline, provides an integral art in the classical architecture. Built on the highest point of the hill in Athens, it is the most famous building of ancient Greek architecture. The one whose ruin still stand today is designed by Ictinus and Callicrates (temple of Athena Nike, built around 449-438 B.C. after the Persians destroyed the first one in 480 B.C.). The period of Pericles is referred to Classical Greece and in most sources, it is suggested that the Parthenon is a perfect example of classical Greek architecture. Therefore, it was chosen to be examined under these criteria:

- 1. It should be a product of the relationship between form and function and not a product of a preconceived formal system.**

The Parthenon's form does not relate to its function the way Fallingwater does. The Parthenon is a Doric peripteral temple that also encompasses elements of the Ionic order. Likewise, to its predecessor the Temple of Zeus at Olympia, it includes the stylobate at the perimeter, the pronaos that leads to the naos or cella, which is where the statue of the goddess was, and at the back the opisthodomos, which was used as the treasury. However, if we compare the two temples floorplans (figures 6, 7) it can be seen, that the interior layouts have some differences between them. Comparing the internal arrangements of the two temples, it is observed that it is less symmetrical. In the temple of Zeus, the naos is in the middle while the pronaos and the opisthodomos are on either side and have the same size, whereas in the Parthenon, the opisthodomos is larger. The treasury (opisthodomos) was used to store valuable items of the people as well as the offerings made to Athena, the Acropolis marked the Athenian

citadel for the Athenian empire, and thus constituting its treasury role of great significance, which could explain its size. In conclusion, its form doesn't directly correlate to its function, however when compared to the older model for the Doric temple, it can be seen that changes were made to accommodate to their needs better as while looking at the old temple of Athena (figure 9).

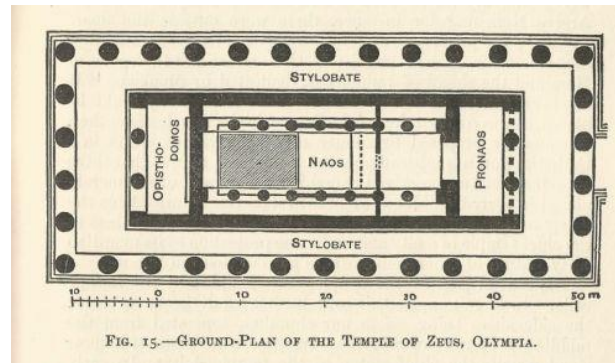


Figure 6: Temple of Zeus architectural drawing (<https://exhibits.library.villanova.edu/ancient-greece/cities/olympia/temple-zeus>) Accessed at 20/5/2020

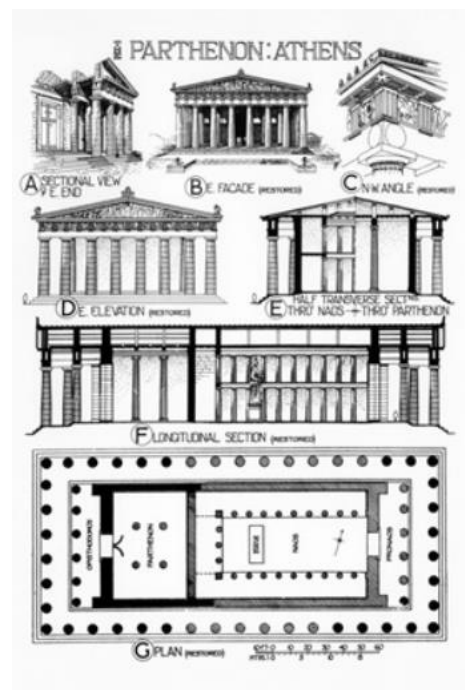


Figure 7: Parthenon architectural drawings (<https://www.architecture.com/image-library/RIBApix/image-information/poster/parthenon-athens-plans-sections-and-elevations/posterid/RIBA100816.html>) Accessed at 2/3/2020

- 2. The structure should unfold like an organism & be in harmony with the environment. It should be in close contact with nature, “grow out of the site”, be unique**

Kuz in her book raises the issue of decay and natural live circle and materiality concrete and marble in ancient Greece and Rome suggest an urge for longevity and for the structure to outlive the designers and stay forever “the Greeks were fighting for permanence” (Kuz, 2003, p.148-149). This quote goes against the natural circle of life, which most buildings also adhere too almost like living organisms.

Furthermore, the plinth that the Temple sits disconnects it from the site and becomes the focal point for the site. As far as its plan is concerned, there does not seem to be any elements that indicate natural growth, as it is contained between a rectilinear space.

3. It should have dynamic forms and not be static

Its prominent position on the Acropolis further symbolises the Athenian wealth and status as a state. This contrived into making an otherwise static form into a dynamic one. Even the interior of the temple playing an important role in that, as it the pronaos opened up to a statue of Athena Parthenos in the naos, which was chryselephantine and approximately 12m tall including the base and left the visitor in awe.

4. Be inspired by nature, be sustainable, healthy, conserving

The Parthenon was built entirely in Pentelic marble, from Pentelicus, a mountain near the Greek capital known even today for its quality marble. As well as timber for the roof, doors and staircases from trees surrounding the site As far as its materiality is concerned, as mentioned above were harvested from the surrounding area, which contributed to less travel distances between the site and the source. Furthermore, marble is resilient to weathering which meant that it did not need constant maintenance. In addition, the pediment of the Temple was ornate with floral sculptures with the most well-known being the one crowning the ridge that has also a prominent part in the Museum of Acropolis (figure 8).



Figure 8: roof ornamentation of the Parthenon (<https://www.theacropolismuseum.gr/en/content/roof-ornamentation-parthenon>) Accessed at 20/5/2020

5. Satisfy social, physical, spiritual needs.

As stated above, the Parthenon was built to celebrate the spirit and wisdom of goddess Athena, the protector of Athens as well as provide a safe keeping place for the Athenian treasure and offerings. Its size and stature on the hill made its purpose clear as it is the prominent feature of the acropolis. This can be seen from figure 9. From these pictures, it can be observed that the temple has moved towards the end of the cliff (acropolis), like in the earlier Temple of Zeus whereas the old temple was further in the back, hidden from plain sight.

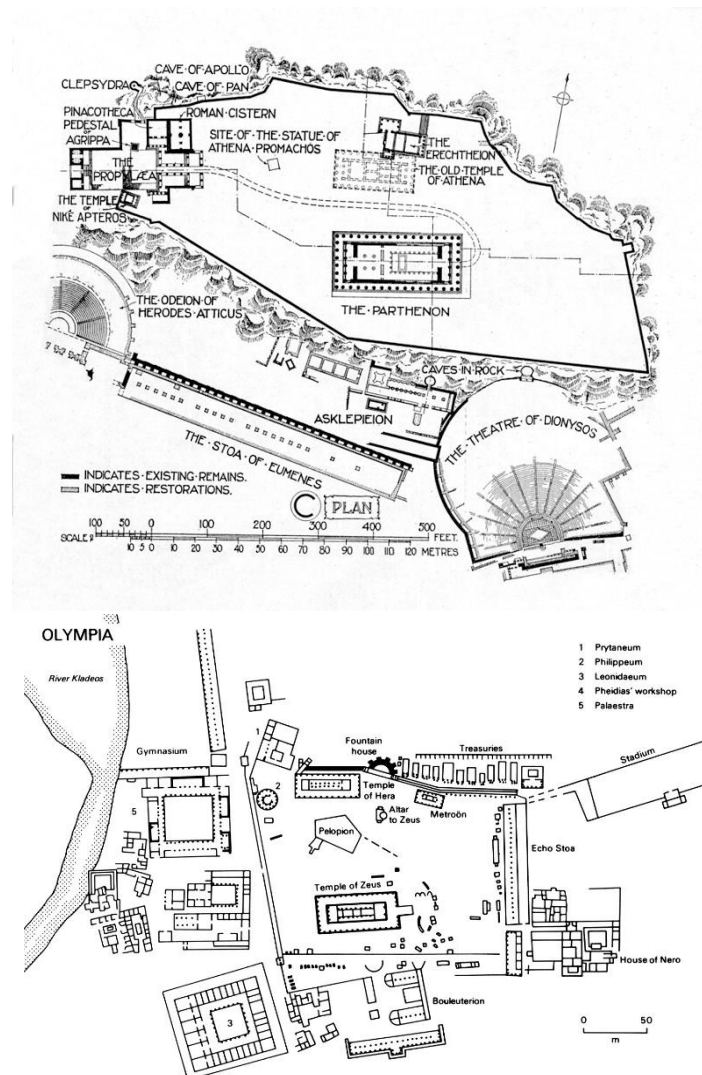


Figure 9: site plans of the Parthenon (top), temple of Zeus (bottom) available at: <https://www.flickr.com/photos/psulibscollections/5832935542/in/photostream> and <https://shelton.berkeley.edu/mymyth/pics5/HA0002090307.jpg> Accessed at 20/5/2020

6. It should be a product of common sense (creative architecture) and be of reasonable duty. It should not try to achieve absolute perfection and proportion. It should be a product of intuitive sensation & imagination

The temple itself was deemed proportionally wrong for the Doric temple standards according to Ms. Emerson in her book however, it suggests that the reason behind this irregularity was purely functional as it was supposed to be able to be visible from the agora. Its longevity also further supports the vigour of Athens and its protector Goddess Athena. To be exact the temple measures 69,51x 30,86m with the interior plan to be of irregular proportions as well since it is divided by two unequal non communicative chambers (Emerson, 2018, p. 98) .These can be seen on the illustration bellow (fig 4).

Bruno Zevi in his book “Towards an organic architecture”, quotes “Behrendt declares that there is only one instance in history of the organic and the formal unity in the same work of art- the Doric temple.” (Zevi, 190, p.69). The Refinements describe all the various ways a Greek temple abstains from straight lines and it is typical to the Doric Temple. According to Ms. Emerson, this is “ an almost organic effect [...] as if the building was a living element”. (Emerson, 2018, p. 102) This phrase could be interpreted as an example to the words of Behrendt. It is a method used in temples like the Temple of Apollo at Corinth that predates the Parthenon and it is a method that evolved with time and is displayed at its finest form on the Parthenon. One very famous example of this construction method is the way the columns of the temple at the base are wider than the top and their flutes increase in depth as well to provide entasis. In addition, the corner columns are thicker than the others to provide additional support and are also set further inwards so that they line up perfectly with the triglyph on the corner; which is an irreplaceable element of the Doric frieze. All of these elements combined ensure that that visitor will be met with a distorted view of the Parthenon that actually make it look perfect, symmetrical and straight. Furthermore, all columns according to the author Mr Emerson are also tilted inwards to blend with the rest of the temple elements. Lastly, the stylobate of the Parthenon is curved upwards so that from a distance the plinth looks straight and light.

7. It should celebrate the spirit of youth and play.

Being a product of thought and not intuition with its design carefully created to deceive the visitor with flawless proportionality, perfection. This proportionality displays the common wealth the impossible, and shows elements of wisdom and maturity, not youthful and playful spirit.

Alvar Aalto - Villa Mairea



Figure 10: Villa Mairea (https://en.wikipedia.org/wiki/Villa_Mairea) Accessed at 17/2/2020

Built by the renowned Finnish architect Alvar Aalto during the period of 1937 to 1939 the Villa Mairea remains to this day one of the most famous examples of not only his work but Scandinavian architecture in general. The Villa is situated in the Maire Gullichsen's estate in Noormarkku. The clients Harry and Mairea commissioned Aalto to design their summer residence in a style that would be contradictory to the Victorian house of her grandfather and the Art Nouveau house of her Father. The main idea behind the style of the Villa was to celebrate the traditional Finnish architecture and try to bring it to modern standards.

1. It should be a product of the relationship between form and function and not a product of a preconceived formal system.

Unlike architects such as Mies van der Rohe, his structural grid is irregular, with distances between the columns differing in order to comply with his vision of each room and its function. Regarding the plans and the special arrangement of the villa, it seems, as there is a mixture of both irregular and regular shapes. The living spaces downstairs are a mixture between open and closed up plans. The walls that enclosed some of the rooms were put in purposely to provide seclusion in spaces such as the library, kitchen, offices and staff quarters, as these needed to be unobtrusive. The same principle applies to the first floor, which accommodates the rooms of the family. Great attention to detail was also given to the curved wall that softens the landing of the first floor. As far as the overall shape is concerned, looking at the southeast elevation, the curved studio stands out. Extending beyond the rest of the villa, enclosed in its timber façade, it is resting on concrete columns that support its weight. True to the idea of Form follows function it is evident in the appearance of the building that, thus the function of its space that dictates how it looks (fig 11).

2. The structure should unfold like an organism & be in harmony with the environment. It should be in close contact with nature, “grow out of the site”, be unique

Its relation to the site through its position in the forest and the materials used, incite a sense of harmony with the surroundings. As seen by the plans in figure 11, it is a 2-storey L shaped building and it is surrounded by pine forests. Timber is the main material used inside and outside the building and connects to the surrounding forest similarly to the Fallingwater. The Art Studio on the 1st floor is “the most organic and indeterminate space of the residence” as stated by Michael Trencher in his book (Trencher, 1996, p.90). This is because it extends beyond the containment of the floorplan of the main house and it is curved with no windows juxtaposing the rest of the structure. The verticality that the timber exterior battens have also connects it to the site and makes it seem as it grows out of the site.

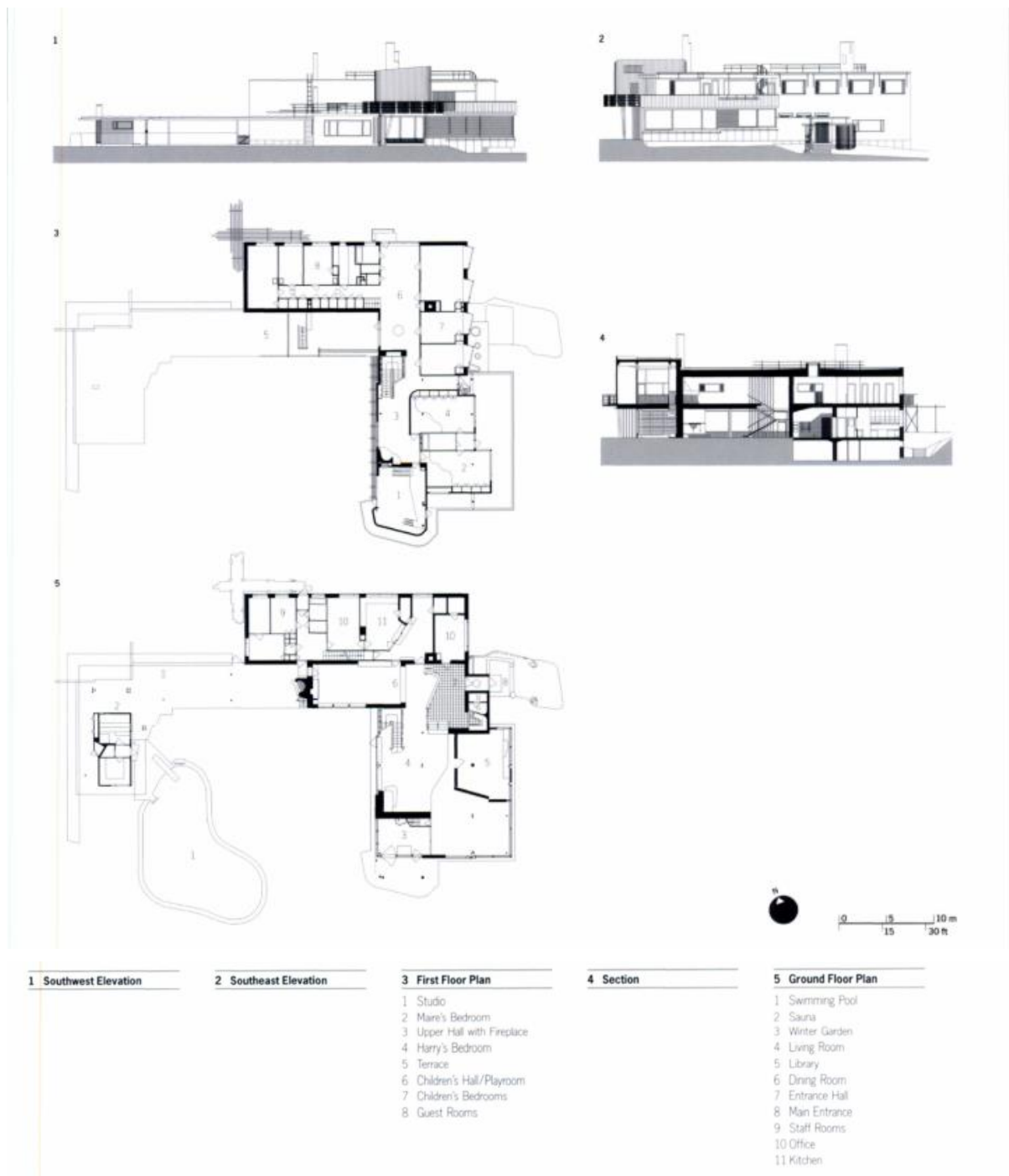


Figure 11: Villa Mairea Floor plans, elevations and schedule of accommodation (Plans, Sections and Elevations: Key Buildings of the Twentieth Century By Richard Weston Plans, p 87)



Figure 12: staircase leading to the main residence area (<https://aeworldmap.com/2018/11/13/sesc-pompeia-sao-paulo-brazil/villa-mairea-alvar-aalto-21/>)

3. It should have dynamic forms and not be static

Villa Mairea, similarly to Fallingwater has a plethora of examples that give it its dynamicity. Of course one of those examples is the studio, as well as the canopy above the entrance, which extend beyond the gridline of the structure. Another example are the windows on another-wise simple façade that extend to the exterior. (fig 10)

4. Be inspired by nature, be sustainable, healthy, conserving

The materials used on the exterior of the house are mainly timber and concrete with glass windows whereas mostly wooden texture with stone and rugs with dominate the interior, which brings the forest indoors and providing a calming environment. Another element that further extenuates this is the staircase and the numerous columns around the living spaces, made to resemble the trees in the estate and to exemplify this idea he made each column different since no tree is alike. This earthy feel of the building also provokes a comparison between Japanese architecture as well, where wooden elements and a deep connection with the outside is always present through using of screens and windows. These indicate that the interior blurred into the exterior similarly to the Fallingwater. Lastly, the undivided floorplan resemble the nature surrounding the villa, where the visitor can wander and explore freely.

5. Satisfy social, physical, spiritual needs.

Alvar Aalto designed Villa Mairea while taking the needs of the clients in great consideration. With his use of natural colours and materials and abundance of natural light and fenestration he created spaces that offered a sense of tranquility, which is important for the work that they produced. In addition,

making the exhibition space a semi-permanent feature in the house, meant that the space could be used more productively from the family like a proper “tupa” space.

- 6. It should be a product of common sense (creative architecture) and be of reasonable duty. It should not try to achieve absolute perfection and proportion. It should be thus a product of intuitive sensation & imagination.**

As suggested by the spatial arrangement and its exterior, it can be understood that creating a building to promote absolute beauty through proportion and geometry was not a priority. This can be understood from the use of both orthogonal and curved spaces in his design. With the Villa, Aalto’s design resembles the irregularity of the forest around him as no space has the same size but altogether form a unit. It is thus not proportion and geometry driven.

- 7. It should celebrate the spirit of youth and play.**

Its shape indicates a sense of playfulness and dynamicity as seen in the studio for example. Aalto as suggested by the Villa Mairea website, states (Villa Mairea, n.d.):

“Only when the structural parts of the building, the forms derived from them through logic and our empirical knowledge are embellished by what we call the art of play, are we on the right track. Technology and economy have always to be combined with the charm that enriches life.”

Hugo Haring - Gut Garkau

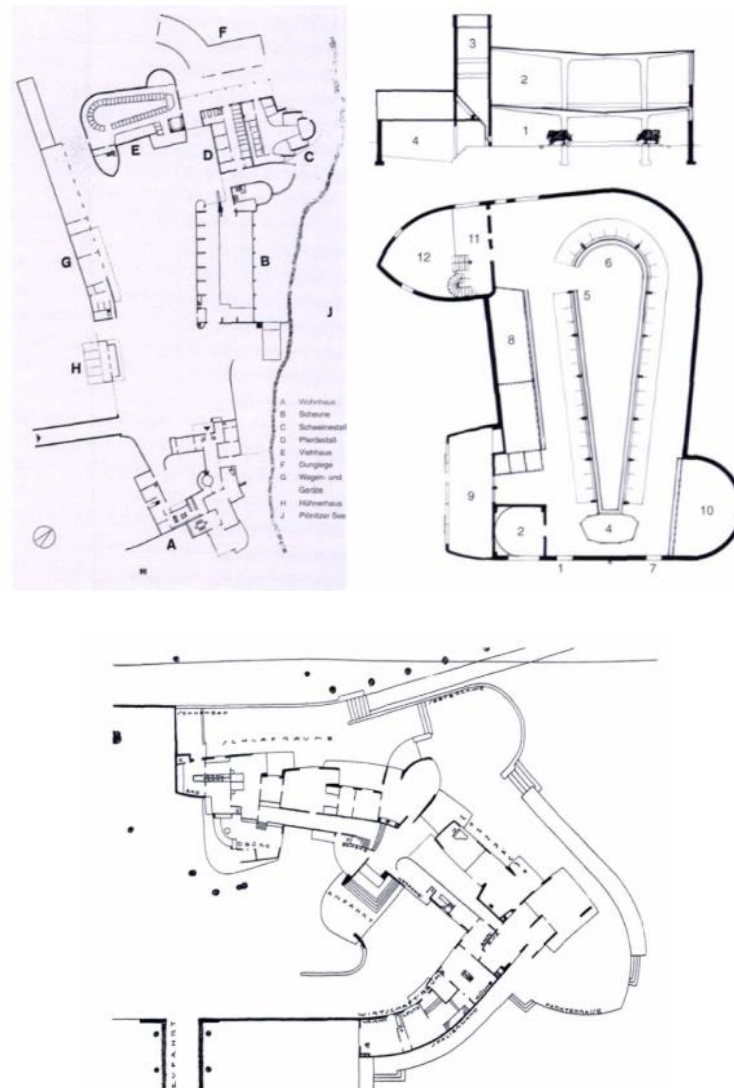


Figure 13: Floorplans showing the entire estate as well as the cowshed (top right) and the Farmhouse (bottom).(
https://de.wikipedia.org/wiki/Gut_Garkau Accessed at 20/2/2020 and (Blundell-Jones, P. (1999). Hugo Häring: The
 Organic Versus The Geometric. Stuttgart: Ed. Axel Menges, p. 56,60,66)

Located in Scharbeutz Germany near Lubeck, the Gut Garkau is the finest example of Haring's Functionalism. It was built during the period of 1922 to 1926 to provide shelter to cows. The client was Otto Birtner, a relatively progressive farmer for his time. As depicted on the floorplan above, the design of this project was intricate.



Figure 14: The barn: material detail. (Blundell-Jones, P. (1999). *Hugo Häring: The Organic Versus The Geometric*. Stuttgart: Ed. Axel Menges., p. 58)

1. It should be a product of the relationship between form and function and not a product of a preconceived formal system.

Taking the cowshed as a main example, its shape was carefully thought of for maximum efficiency. According to Peter Blundell Jones in his article: “Hugo Häring and the Search for a Responsive Architecture” he quotes Häring *'The form or arrangement of this building was won (or discovered) through pursuing the goal of correspondence to the demands of performance fulfilment in the most straightforward and simple way.'* (Jones, 1986, p40). More specifically, he curved the walls to allow the cows to not trap themselves in the corners and wait the workers to help them out. It also made the feeding process more efficient as well as other mundane tasks. An example to that being the surveillance of the herd as well as the disposal of their waste. Finally, as seen on the section, the sloping of the roof provided better ventilation in the cowshed as well. This agrees with the notion that form should follow function.

As far as the Farmhouse is concerned, the floorplan forms a U-Shaped structure with asymmetrical rooms on the inside. It is situated south of a lakeside. On the Southeast, the majority of the living spaces and bedrooms are located in order to benefit the most from the lake as well as the fenced garden next to it whereas the office wing lies on the north side of the house. On the East side of the house many of the entertainment spaces are placed including the greenhouse whereas the central staircase is located in the middle of the estate

and aligned with the living room wall. That way he achieved better circulation around the space as well as best views and sunlight gain.

2. The structure should unfold like an organism & be in harmony with the environment. It should be in close contact with nature, “grow out of the site”, be unique

According to Haring in his essay “Wege zur form” as Jones suggests, he writes about letting the design grow from within and express its own individuality and not the architects. This in turn results in attributing the building organism- like qualities; Organ-haft, wesenhafter. Another important elements that gives the building its “gestalt”, being-like nature is its pear shaped plan and the juxtaposing linear extrusion of it from the section. According to Haring, the linear shows a system that keeps extending with no ends but the pear one portrays two co-existent independent systems that also work differently. These elements of the cowshed together with the rest of the Gut Garkau and its different design elements, further prove why Haring’s functionalistic approach to architecture extenuates its organic nature as well. This in result create a unique structure that is specifically made for that site and for that specific number of cows (42) as it was suggested by Jones in his essay.

3. It should have dynamic forms and not be static

Extreme cautious and detail can be seen in the bonding of each element such as the bricks and the timber battens. Some placed with English garden wall bond and others on a vertical stretcher bond, provided visual aid in achieving an elegant result. An example to that is the curved wall where it allowed the bricks to be placed flat on it giving it also a sense of height. The timber batten pattern on the barn door with provides an architectural interest as well, as suggested by Jones on page 59. Finally, the intricate shapes dictating both the outside as well as the inside indicate that the Gut Garkau is a building that expresses dynamism and movement.

4. Be inspired by nature, be sustainable, healthy, conserving

The materials used in this scheme were mostly timber and brick on a concrete frame and due to his extensive use of materials; he juxtaposed the CIAM white, minimalistic buildings. Another aspect of organic design is his choice to also use local materials such as straw and that all of them were kept to their original colour similarly to Fallingwater.

5. Satisfy social, physical, spiritual needs.

According to Jones, Haring interviewed the workers to make sure that as stated above, the work tasks would be dealt as efficiently as possible. In addition, the placement of each kettle in the shed would be in accordance to where they need to be; an example is that the bull will be placed in the middle to show dominance. This shows that Haring in the construction of the Gut Garkau took a utilitarian approach which based the design process solely on how the space would be used to satisfy the needs of his client.

- 6. It should be a product of common sense (creative architecture) and be of reasonable duty. It should not try to achieve absolute perfection and proportion. It should be thus a product of intuitive sensation & imagination.**

Looking at the site plans as well as the plans of each building, it can be understood, that a Functionalism dictates the scheme and not a notion for proportion. The relation between the spaces seems to be of most importance in this scheme similarly to the works of Aalto and Wright. In addition, looking at the pear-shaped floorplan, the structural grid used cannot be understood at a first glance as in Falling water and Villa Mairea. It however can be understood, that the design process was similar to the organic American approach suggested by Zevi (figure 3). Similarly to Fallingwater, it looks as if the spaces with numbers 11, 12, 9, 10 (figure 13) where an extension from the middle curved open space to satisfy the needs of the client. These include the spaces where the young bulls and the heifers were kept, the root cellar, and the silo cover.

- 7. It should celebrate the spirit of youth and play.**

Haring's Gut Garkau showed elements of playfulness in the construction techniques that he used. According to Peter Blundell Jones, the brick bonding on the side which changes from vertical to horizontal was made to connect the build to vernacular German architecture and integrate an element of play whilst deviating from Functionalism. In addition, the exposed concrete frame and the contrasting textures created from combining the different materials also show an element of youth and play together with the curved shapes.

Palladio - Villa Rotonda

The Villa Rotonda, formerly known as Villa Carpa, is undoubtedly one of Palladio's most famous and notable Villa. Built near Vicenza on top of a hill in northern Italy during the period of 1566-1590. It embraces elements of classical architecture, symmetry and Vitruvian architecture as well. Unfortunately, however, Palladio himself did not live to admire his work as he died 10 years prior to its completion and so the project was completed by Vincenzo Scamozzi. The client of this building was Roman citizen called Monsignor Paulo Amerigo, a retired ecclesiastic during the time of Popes Pio 4th and 5th from the papal court of Rome who wanted to utilize the villa to host various events. The form of the villa was thus different in comparison to the Palladian designs for "working villas". Palladio's concept of the villa plan "as a digestive system of service space functioning in support of the placid physiognomy of the served" (Kuz p. vi), which directly correlates back to 'form follows function'. The client gave the building its name in affiliation to the Santa Maria "Rotonda" in Rome, which is universally known as the Pantheon.

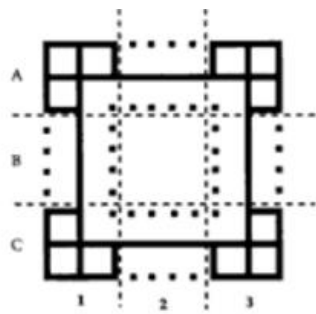


Figure 15: Serlio's 3 by 3 grid Poggiorealle:
(Hersey and Freedman, 1992, p. 22).

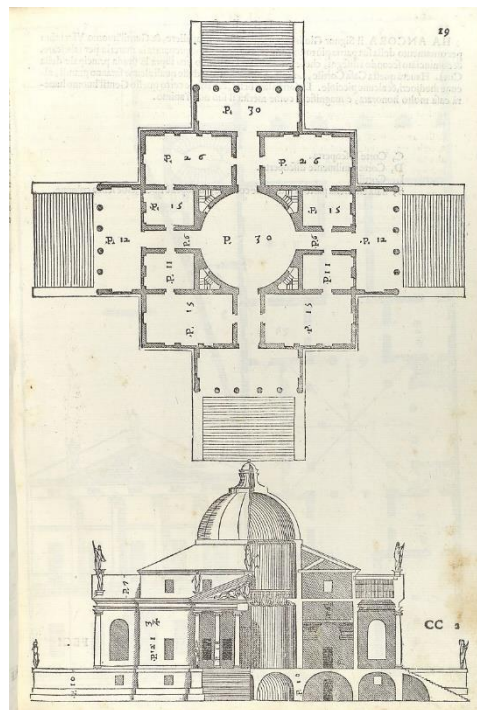


Figure 16: Villa Rotonda:
(<https://www.metmuseum.org/art/collection/search/698054>) Accessed at
20/2/2020

1. It should be a product of the relationship between form and function and not a product of a preconceived formal system.

What makes this building so interesting is the perfectly symmetrical floorplan with the identical façade in all four sides. According to Hersey and Freedman, in their book “Possible Palladian Villas: (plus few instructively impossible Ones)”, this is a technique that many architects of this time espoused, with some examples being Vitruvius and Serlio, called *Poggiorealle*. It is a technique geometrically and symmetrically heavy. A *Poggiorealle* that is similar to that of the Villa Rotonda is Serlio’s 3x3 as shown below (figure 12) (Hersey and Freedman, 1992, p. 22). In addition, it also indicates how this type of strategy can lead to a central-driven floorplan as in the Villa Rotonda’s central dome. Thus, it is understood that the form of the building is not influenced by its function.

2. The structure should unfold like an organism & be in harmony with the environment. It should be in close contact with nature, “grow out of the site”, be unique

The Villa, does not grow out of the site, nor unfold like an organism. However, its unique classical stance is integrated harmoniously in the Italian landscape and even compliments it with its beauty. As Frank Lloyd Wright states in 1932: *"No house should ever be on a hill or on anything. It should be of the hill. Belonging to it. Hill and house should live together each the happier for the other."* This is what Palladio has achieved with this villa as well as a sense of tranquility to the visitor. Furthermore, the repetition of the façade on all four sides constitutes it unique.

3. It should have dynamic forms and not be static

In addition it is also interesting to note how its position, materiality and form reminiscent a Roman temple or an Acropolis in the Italian countryside providing thus a dynamic element to the landscape. Finally, even though it is of static nature, together with its position on the site, actually creates a sense of greatness and dynamicity to the structure.

4. Be inspired by nature, be sustainable, healthy, conserving

The Villa was made using stucco covered bricks as well as stone for the finer details such as the columns, capitals and windows. This provided a cheaper alternative to the design but could potentially need more maintenance constituting it less sustainable. Furthermore, even though the geometrical principles that Palladio used to design the villa exist in nature (golden section) it is not inspired by nature like the other Organic Buildings mentioned in this dissertation.

5. Satisfy social, physical, spiritual needs.

The windows of the villa and its orientation also play an important role. The windows are situated all around the villa to promote further the clients wish for an entertainment space, as he wanted the visitor to be able to see the beautiful Italian countryside or sea at will. According to the authors Imrie and

Street in their book *Architectural Design and regulation*, they state that in his words: (Imrie and Street, 2011, p. 10)

“the place is nicely situated and one of the loveliest and most charming that one could hope to find; for it lies on the slopes of a hill, which is very easy to reach. The loveliest hills are arranged around it, which afford a view into an immerse theatre; because one takes pleasure in the beautiful view on all four sides, loggias were built on all four sides.”

This indicates that the relationship between the form and the environment was greatly considered in order to also satisfy the needs of the client and to have it function differently from his typical villas.

- 6. It should be a product of common sense (creative architecture) and be of reasonable duty. It should not try to achieve absolute perfection and proportion. It should be thus a product of intuitive sensation & imagination.**

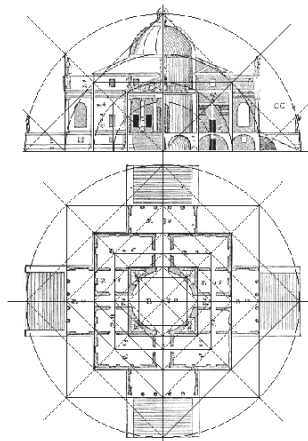


Figure 17: Geometrical analysis of Villa Rotonda: (<http://www.podiumx.com/2012/11/villa-la-rotonda-de-andrea-palladio.html>) Accessed at 25/5/2020

The Villa undoubtedly introduces a classical element of architecture to the Vincentian landscape. Its design was made taking proportionality and geometry in great consideration. As suggested from the figure above, Palladio tried to achieve absolute perfection and proportionality with the Villa by introducing the golden section into his design and by repeating the same façade on all four sides.

- 7. It should celebrate the spirit of youth and play.**

The Villa shows a sense of maturity not youthfulness and play. With the classical style facades dominated by columns, gables and pediments, imposes itself on the landscape

Mies van der Rohe - Farnsworth House

The Farnsworth House by Mies van der Rohe is situated in Plano Illinois in the United States of America and was built around 1945 to 1951. The client for this project was Edith Farnsworth, a well-known neurologist of post war America, fascinated by the idea of “Less is more”, which is how the architect described his individual style. The purpose of this project was to create a weekend destination for her.

1. It should be a product of the relationship between form and function and not a product of a preconceived formal system.

Its form, even though it was not primarily influenced by the function, it showed hints of that. One example to that is the location of the service zone and the elevated structure. As seen from the floorplan bellow, (Figure 12) the structure is an elevated single storey pavilion sitting on empty field. All sides of the house are made primarily from glass providing thus views to the outside from all angles as well as the steel white columns supporting it. This also meant that utilities such as the restrooms, fireplace and the kitchen appliances had to be positioned in the centre of the plan and the living spaces around it. This bares similarities to the Greek temples like the Parthenon, which further indicates that it is a product of a preconceived formal system.

2. The structure should unfold like an organism & be in harmony with the environment. It should be in close contact with nature, “grow out of the site”, be unique

Moreover, it does not show elements of organism-like attributes like the Gut Garkau. Some details from the building that stand out as far as the structure is concerned, is the use of the long horizontal cantilevers. They bare similarities to the Frank Lloyd Wright building Fallingwater combined with the low ceiling height, use of glazing and horizontal elements in the design. They both draw the eye towards the exterior and truly bring the outside in. This indicates that there is a harmonious relationship between the House and the site. Furthermore, it could be argued, that the vertical steel beams mimic the verticality of the trees around it, which ties back to the theme of growing out of the site.

3. It should have dynamic forms and not be static

Overall, according to the writings of Mr. Richard Weston: (Weston, 2004, p. 92).

“The Farnsworth House retained something of the dynamism and asymmetry that characterized his work of the 1920s, but in retrospect its frozen perfection and hidden symmetries can be seen to have announced the direction towards the more static, symmetrical and essential neo-Classical design”

These elements altogether test furthermore the boundaries between organic and inorganic architecture especially taking this statement in consideration. Proportionality and symmetry were taken greatly into

consideration. They provided a harmonious decorative element of design in this minimalist building with an example being

4. Be inspired by nature, be sustainable, healthy, conserving

The architecture responds to the environmental conditions present by being raised 1.5m above the flood plain. This meant the excess water did not need to be redirected and could flow right through the site. It however is not sustainable as the energy loss and gain inside the building is comparable to a green house, constituting it impossible to live in in certain weathers according to the client. The materials used in the House include treated timber panels and travertine stone, which is a type of limestone, native to the Illinois scenery.

5. Satisfy social, physical, spiritual needs.

This statement also relates to this criterion, as it indicates that the house does not respond to the client's needs completely. Furthermore, to accommodate the privacy of the resident, Chinese silk curtains were used. It is also important to note that when the curtains are closed, shadows from the trees adjacent to the house get casted on them which according to the later owner of the property Lord Palumbo created a sense of awareness of the surrounding nature almost like coming alive.(Weston, 2004, p. 92). To access the house, the visitor has to climb a long and wide flight of stairs with a spacious landing. As far as the furnishing and materiality of the building is concerned, Mies van der Rohe's own furnishings like the Barcelona chair appear in the house. This gives a luxurious feeling to the house in combination with the travertine floors, primavera timber panelling on the interior walls and panels of the space as well as the steel frame of it painted white to hide the material and unpleasant to the eye structural elements and express a light and minimal visual. These all agree with the client's vision of "Less is more" like the architect.

6. It should be a product of common sense (creative architecture) and be of reasonable duty. It should not try to achieve absolute perfection and proportion. It should be thus a product of intuitive sensation & imagination.

It seems to be overall a product of thought, not intuition and common sense. As suggested from its minimalistic and proportional floorplan.

7. It should celebrate the spirit of youth and play.

In addition, it does not celebrate the real and the spirit of youth and play. Its position and stance show its dynamism on the site being simple, tranquil yet authoritarian in nature.

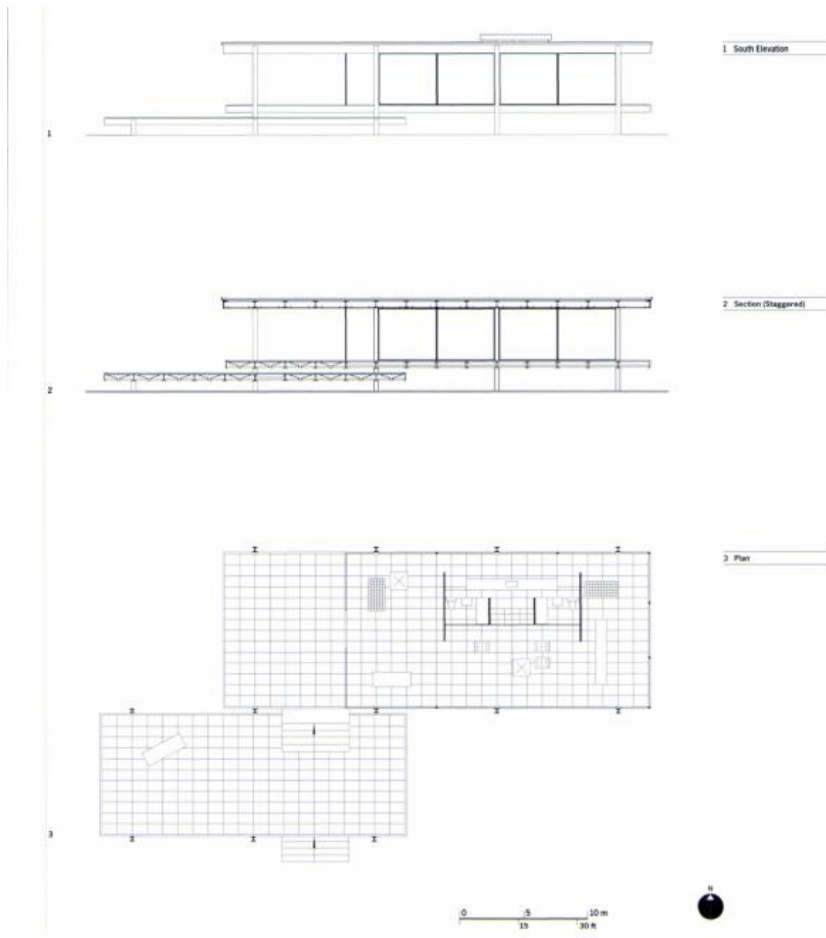


Figure 18: Farnsworth House floorplans and elevations (*Plans, Sections and Elevations: Key Buildings of the Twentieth Century* By Richard Weston *Plans*, p. 93)

Conclusion and discussion

Looking at all of these extraordinary buildings and analysing them gave the opportunity to understand further the design process of each architect better as well as each building. Villa Mairea, Fallingwater and Gut Garkau, all three buildings that are already perceived as organic. It can be seen that indeed, they adhere to all the criteria created in the methodology chapter of the dissertation. This was not surprising as they are used as clear and distinct examples of the Modern Movement for their organic nature. However, it was interesting to see the Parthenon, Villa Rotonda and the Farnsworth House, being regarded as classical also showed elements of organic architecture as they agreed to some of the criteria. Elements such as materiality, position on the site as well as organisation of spaces played an important role in determining those elements that made them fit with the criteria given. All three classical buildings even though they are of static nature, their position in the site impose a dynamic side to them and they all seem to be in harmony with it. However, only the Parthenon seems to indicate organic influences in its design such as the floral roof ends. Furthermore, with its use of Refinements, it creates an elusive proportionality to the visitor. On the other hand, both the Farnsworth house and the Palladian Villa used geometry and proportion without such tricks in their design.

According to Peter Blundell Jones, in his journal, he describes the architectural expression of architects such as Wright, Haring as “the urge to find the specific” whereas the architecture of architects such as Mies van der Rohe, Gropius as “the urge to find the universal” (Jones, 1986, p42). This could explain why there is such a divide in the modern movement concerning these two schisms or design. This however does not explain why with the passing of time, the term has been used to describe architecture that looks completely different from one another.

Bruno Zevi however, in his book “Towards an Organic Architecture” (1950), Zevi encapsulates organic architecture as: (Zevi, 1950, p. 76).

‘Architecture is organic when the spatial arrangement of room, house and city is planned for human happiness, material, psychological and spiritual. The organic is based therefore on a social idea and not on a figurative idea. We can only call architecture organic when it aims at being human before it is humanist.’

This statement summarises perfectly what organic architecture aspires to be. With its laconic nature, it is free and ever evolving like a true organism that cannot be confined; maybe this is why no one interpretation has been made. In that case though, its purpose is clear, to provide the user with an incredible experience in a space.

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Appendix

Tables

Organic Architecture	Inorganic Architecture
1. Formative art	1. 'Fine art'
2. Product of intuitive sensations	2. Product of thought
3. Work of intuitive imagination	3. Work of constructive imagination
4. In close contact with nature	4. Contemptuous of nature
5. The search for the particular	5. The search for the universal
6. Delighting in multiformity	6. Aspiring towards rule, system, law
7. Realism	7. Idealism
8. Naturalism	8. Stylism
9. Irregular forms (medieval)	9. Regular forms (classic)
10. The structure like an organism that grows in accord with the law of its own individual existence, with its own specific order in harmony with its own functions and with its environment, like a plant or any other living organism	10. The structure like a mechanism in which all the elements are disposed in accord with an absolute order, in accord with the immutable law of an priori system
11. Dynamic forms	11. Static forms
12. Forms based on freedom from geometry	12. Forms based on geometry and stereometry
13. Product of commonsense (creative architecture), of 'reasonable beauty'	13. The search for perfect proportion, for the golden section and for absolute beauty
14. Anti-composition	14. Composition
15. Product of contact with reality	15. Product of education

Zevi, 1950, p69

Gaia Charter (Pearson, 2001, p.72)

"Let the design:

- be inspired by nature and be sustainable, healthy, conserving, and diverse.
- unfold, like an organism, from the seed within.
- exist in the "continuous present" and "begin again and again".
- follow the flows and be flexible and adaptable.
- satisfy social, physical, and spiritual needs.
- "grow out of the site" and be unique.
- celebrate the spirit of youth, play and surprise.
- express the rhythm of music and the power of dance.

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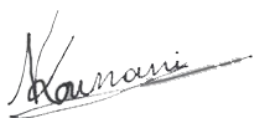
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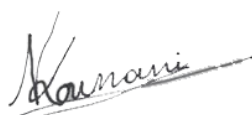
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