Rationalism in architecture: 18th and 20th century

Introduction

Rationalism began as a 17th century ideology that led to the Enlightenment, a period in history where reason was the primary instrument for justifying and understanding the 'hows' and 'whys' of things and circumstances. The Enlightenment was a time where concrete evidence through scientific research flourished and Rationalism influenced all field of endeavors and even simple daily tasks.[1] In layman terms, to be rational is to be understandable, measurable or definite. Using this as premise, Rationalism in architecture therefore pertains to accuracy in designing and building the height, breadth or depth of a structure. Architectural Rationalism was a solid evidence of the Enlightenment influence in the field of architecture. It continues to persist in the modern world as an independent art movement though much of the modern Rationalist designs have little resemblance to Enlightenment architecture.

Henceforth, this essay attempts to contextualize Rationalism by differentiating its two variants: 18th century Rationalism and the recent 20th century development. The similarities and differences of their respective designs and, if possible, functions are noted to give us an idea on how Rationalism has evolved as an architectural ideology. The essay also includes discussions on sub-movements, their pioneers and their trademarks.

18th Century Rationalism

The Enlightenment Architectural Rationalism was focused on being symmetrical, having accurate measurements of classic shapes, and

functionality. It clearly reflected the spirit of the times where science, mathematics and logic were at the peak of their influence.

Neoclassicism was a widespread movement under the Rationalist wing. It was established in reaction to the flamboyant and seemingly excessive Baroque and Rococo styles. During the neoclassicist boom, many artworks and structural designs of the classical Graeco-Roman era were recalled together with the architectural works of Italian Andrea Palladio.[2] The movement was named 'neoclassical,' as opposed to pure classicism, as not every classical design was applied therein. Neoclassicists only selected from the wide array of designs those feasible to society. Neoclassicist designs were characterized as follows: symmetry, columns that functioned as support, minimalistic design composed of basic geometric shapes, and an overlaid triangular gable commonly known as pediment. The symmetry, functionality, and geometrical aspects of the neoclassicist movement were defining characteristics of the Rationalist ideology.[3]

The Pediment[4] A Column[5]

Existing in the 16th century towards the culmination of the Renaissance period, Andrea Palladio was the first known architect to revive and apply the classical designs of Graeco-Roman society in many villas, palaces and basilicas. His architecture became an essential foundation of Enlightenment Architecture. As a dedicated follower of Vitruvius and his timeless principle of 'firmitas, utilitas, venustas,' Palladio carefully ensured that his structural designs were durable, useful, and attractive as stipulated by Vitruvius in his ten-volume masterpiece 'De Architectura.' Palladio was also particular about proportions and putting a purpose on every structural component.[6] For

instance, a portico or terrace must be utilized in such a way that the surrounding scenery was seen in its full glory. He wanted geographical attributes of the estate to match with the house's structural design. The palazzos, villas and basilicas he designed displayed the intermingling values of beauty and the social environment and position of their respective owners. An urban palazzo was different from a provincial palazzo; likewise, an agricultural villa was different from a residential villa. Palladio designed structures according to their context.[7]

Palladio had contributed several design innovations in public buildings and churches. Most Palladian works were made of affordable materials, usually stucco, traditionally made with lime, sand and water, to cover and bind bricks. His urban structures for prestigious Venetian owners had high classical porticos with pediments that extended as far as the second floor and were supported by giant colonnades. These porticos were raised above ground level and on the same level as the rest of the ground floor. This raised floor called 'piano nobile,' was reused in later variations of neoclassical architecture. Palazzo Chiericati in the city of Vicenza was a fine example of this urban structure.[8]

Palazzo Chiericati (1550-1557)[9]

Rural villas were rather different. Instead of the piano nobile, there was an elevated podium bordered by lower service wings, connected with an elegant curving flight of stairs. The owner maintained residence at the elevated portion. Villa Foscari (also La Malcontenta) was among the mid-16th century designs of Palladio that employed this renowned building format.

Villa Foscari (1559)[10]

The 1570 publishing of Palladio's work 'Quattro Libri dell'Architettura' (The Four Books of Architecture), stretched his influence far beyond his home country Italy. Palladio's architectural drawings and discussions contained in the book set the stage for neoclassicist expansion in the key European countries of France, Britain, Ireland, Spain and Germany.[11] Even more remarkable was his influence in colonial and post-colonial America, where his designs were replicated in the houses of well-known families, state buildings and even the private abode of Thomas Jefferson, the freedom President.[12] Along with Palladio's treatise, the unearthing and discovery of Pompeii and Herculaneum, Roman towns destroyed by volcanic eruption during the classical period, was thought to inspire the interior designs of 18th century European houses and edifices.[13]

The Ruins of Pompeii[14] Interior View of a Herculaneum House[15]

In Europe, neoclassicist architecture developed at different paces. Some sources estimated that the movement reached its peak in France with Étienne-Louis Boullée and Claude Nicolas Ledoux. The two architects followed principles of rationality into their Graeco-Roman inspired designs. Boullée was known for fusing geometry with the standard classics. This original neoclassical deviation might have been influenced by his work as an educator and philosopher at ''École Nationale Des Ponts et Chaussées.' Like most neoclassicists, his designs were minimalistic, devoid of ornamentation, bold enough to repeat certain structural components, especially if they were functional (i. e. columns), and sought to emphasize the purpose of the structure and its parts. Boullée also proposed a cenotaph, an approximately 500-foot sphere rooted on a round foundation, for the English scientist Isaac

Newton. This was not feasible to build but as a professional engraving, the style gained prominence. Boullée's works were later revived by 20th century Rationalists and more popularly by renowned Modernist architect, Aldo Rossi. Contemporary architects found his designs unique and very inventive - although some would consider them 'illusions of grandeur.' The Hôtel Alexandre in Paris, known for its flanking courtyard doors and Corinthian columns, was one of Boullée's surviving works.[16]

Cenotaph for Newton (1784)[17] Hôtel Alexandre (1763-66)[18]

Like his compatriot, Ledoux was very idealistic in his architecture, always wanting to 'build with a purpose.' For this he and Boullée were branded 'Utopians.'[19] Ledoux designed many theatres, hotels, residential homes, and buildings, supplied with rotundas, columns and domes from the Graeco-Roman period. His known architectural innovation was the 'architectonic order,' best exhibited through his design on the Royal Saltworks at Arc-et-Senans. He was appointed Royal Architect for the express purpose of building a structural design for efficiently extracting salt. The Royal Saltworks became a significant example of 18th century Architectural Rationalism for its extensive use of geometry and logical arrangement of shapes to facilitate the extraction and transportation processes. Another design was drawn after the first was disapproved.[20]

Facade of the Royal Saltworks, France[21]

Aerial View of Ledoux' Second Design (1804)[22]

There were many other prominent figures under the neoclassical movement but few were as Utopian as the works of Boullée and Ledoux. French writer-teacher-architect Jean-Nicolas-Louis Durand influenced several German

Rationalists by adding principles of economy and convenience to the existing architectural Utopia.[23] The later renditions of neoclassicism in Britain, America, and Spain disregarded the attachment to symmetry and geometry that Palladio himself and the French neoclassicists were very particular. However, they did retain much of the functionality aspect. For example, neo-Palladian British architects William Kent and Indigo Jones invented the flanking wings to give more space in the house interior.[24] This concern for utilizing space was still an archetype of 18th century Rationalism.

20th Century Rationalism

20th century Rationalist architecture was interchangeably called Neo-Rationalist. Although the designs were different from 18th century rationalism, neo-Rationalists continued to practice important principles of Rationalist Architecture. The simplistic form and ornamentation was still retained; the functionality aspect became known as 'theme.' In fact, as many historians claimed, neo-Rationalism was an evolution of 18th century Enlightenment Architecture.[25] The need to justify architectural works remained strong as it had then. The Enlightenment brought about the Industrial Revolution around 18th-19th centuries. The effects lasted and were carried over to the 20th century, where industrialization became a fad. Economic advancement was no longer associated with brick and wood but with new elements like steel, iron and glass. As industrialization reached its peak in the 20th century, the growing importance of machinery led to the development of an 'industrial architecture,' composed of those new elements.[26]

Modernism was the dominant rationalist movement of the 1900s. It basically aimed to employ new materials suited to the spirit of industrialization and free architects from the bondage of styles, which curtailed individual touches. The works of early Modernists Ludwig Mies van der Rohe and Walter Gropius in Germany and Frenchman Le Corbusier were mostly products of socio-political revolutions. Following World War I, the German Modernist ventured into new structures that 'meet social needs.'[27] The Bauhaus design school resulted from this venture. Bauhaus became identified as the 'International Style,' adopted by many Modern structural designs in various countries.[28] The following are famous examples of Bauhaus architecture:

The UN New York Base by Le Corbusier[29] The Gropius Residence in Lincoln[30]

The International Style was characterized by rational principles of minimalism and functional design and structure. Neoclassical pediments, columns and flanking wings were replaced by rectangular shapes of concrete cement, steel, and other new elements. There were hardly traces of particular cultures or social context and a neutral architecture that was universally applicable prevailed.[31]

Modernists like Frank Lloyd Wright tried to balance nature and structural designs.[32] Later, Postmodernist movements emerged to deconstruct the universality of Bauhaus and infuse 'local identities' into modern architecture so it can connect with people's sentiments.[33] Aldo Rossi, Italian theorist-architect-designer-artist, was among the celebrated Postmodernists. His valuable contribution to urban architecture was building contemporary structures without neglecting the historical value of the city or site where it

would be built. He stressed the social significance of monuments and cemeteries and also advocated that structures be strong enough for succeeding generations to witness.[34] San Cataldo Cemetery expanded by Rossi (1971)[35] Bonnefanten Museum, Maastricht by Rossi (1990-1994)[36]

Conclusion

18th and 20th century Architectural Rationalists are linked by the ancient principles of 'utilitas, firmitas, venustas.' Their respective movements were generally non-ornamental and useful in structure, design and theme. In the area of symmetry, the use of geometrical shapes, and projecting cultural and individual sentiments, the two Rationalist regimes differ. 18th century Rationalists were unified in advocating truth and beauty in architecture while neo-Rationalists had individual contradictions.[37] Nevertheless, both strands justified Architecture's major roles in society and in people's lives.

Sources

[1] Hackett Lewis. (1992) 'The age if enlightenment,' History World International at http://history-world. org/age_of_enlightenment. htm

[2] Steve Fallon & Nicola Williams. (2008) Paris: city guide, United Kingdom, Lonely Planet Publications, p. 48.

[4] University of Pittsburgh at http://www. pitt. edu/~medart/menuglossary/pediment. htm

[5] Old House Web at http://www. oldhouseweb. com/architecture-and-design/greek-revival-1820-1850. shtml

[6] Bernd Evers, Christof Thoenes & Kunstbibliothek. (2003) Architectural theory: from the renaissance to the present, Germany, TASCHEN pp. 6-7.

[7] Sam Smiles& Stephanie Moser. (2005) Envisioning the past: archaeology and the image, Maine, Blackwell Publishing pp. 98-114.

[8] Douglas Lewis, Andrea Palladio & International Exhibitions Foundation. (1981) The drawings of Andrea Palladio, Texas, The Foundation, pp. 158-163.

[9] Essential Architecture at http://www. essential-architecture. com/STYLE/STY-E14. htm

[11] Caroline Clifton-Mogg. (1991) The neoclassical source book, New York, Rizzoli, pp. 88-175.

[12] David Watkin. (2005) A history of western architecture, London, Laurence King pp. 114-513.

[13] H. Keethe Beebe. (1975) 'Domestic Architecture and the New Testament,' The Biblical Archaeologists, volume 38, number 3/4, pp. 89-104.

[14] Virtual Tourist at http://cache. virtualtourist. com/1898061-Pompeii-Pompeii. jpg

[16] Helen Rosenau. (1976) Boullée & visionary architecture, New York, Harmony Books pp. 1-27.

[19] Barry Bergdoll. (2000) European architecture, 1750-1890, New York, Oxford University Press p. 97.

[20] Elizabeth Basye Gilmore Holt. (1966) From the classicists to the impressionists: art and architecture in the nineteenth century, Connecticut, Yale University Press pp. 227-311.

[21] United Nations Educational, Scientific and Cultural Organization at http://whc. unesco. org/en/list/203

[23] Joy Monice Malnar & Frank Vodvarka. (2004) Sensor design, Minneapolis, The University of Minnesota Press p. 8.

[24] Inigo Jones, William Kent. (1727) The designs of Inigo Jones: consisting of plans and elevations for publick, England, W. Kent pp. 1-73.

[25] Christopher Crouch. (2000) Modernism in Art Design and Architecture, New York, St. Martin's Press pp. 1-10.

[26] 'Industrial architecture,' EncyclopÃ¦dia Britannica Online at http://www. britannica. com/EBchecked/topic/286910/industrial-architecture

[27] Richard J. Evans. (2003) The coming of the third reich, New York, The Penguin Press, pp. 122-123.

[28] Henry Russell Hitchcock & Philip Johnson. (1997)The International Style, New York, W. W. Norton & Company, pp. 1-5.

[29] 'International Style' at http://architecture. about. com/od/20thcenturytrends/ig/Modern-Architecture/International-Style. htm

[30] The Digital Archive of American Architecture at http://www. bc. edu/bc_org/avp/cas/fnart/fa267/gropius. html

[31] Hazel Conway & Rowan Roenisch. (1994) Understanding architecture: an introduction to architecture and architectural history, London, Routledge pp. 22-24.

[32] Kathleen Karlsen. 'Saving Civilization Through Architecture - Rationalism and the International Style,' at http://ezinearticles. com/? Saving-Civilization-Through-Architecture---Rationalism-and-the-International-Style&id= 888138

[33] Hazel Conway & Rowan Roenisch. (1994) Understanding architecture: an introduction to architecture and architectural history, London, Routledge pp. 22.

[34] Terry Kirk. (2005) The architecture of modern Italy, volume 2: visions of utopia 1900-present, New York, Princeton University Press pp. 208-214.

[35] Cornell University Blog at http://blogs. cornell. edu/tim/2008/09/21/cities-sites/

[36] Brian Rose at http://www. brianrose. com/portfolio/bonnefanten/bonnefan. htm

[37] Sarah Williams Goldhagen. 'Ultraviolet: Alvar Aalto's embodied Rationalism,' Harvard Design Magazine at http://www. sarahwilliamsgoldhagen. com/articles/Ultraviolet. pdf