
Current trends in architecture at the right typological objects?

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Abstract: Global transformational processes are taking place in the modern world, covering and creating the material environment of a person, capturing the worldview of a person, philosophy, methodology, culture, science, and education.

Social transformations, scientific, technical, and cultural progress, the way of life and way of life of a person, regional, cultural-historical, and natural conditions - everything finds expression in architecture, which is understood broadly - from urban planning systems to individual buildings and their details, from the worldview of a person to creative thinking, ego culture, knowledge, education. The research methodology is presented in library form and uses articles, and descriptions of the bureaus themselves and the architects of the respective websites in this study. The text presented here quantitatively shows the modern architecture of the world in different typological aspects and different directions. The results indicate that despite the different styles, there is a common direction of development of architecture in the layer of ecology and plasticity in different continents. Most often, all buildings are created in such a way that they are noticed and surprised. Modern architecture was formed in contrast with giving value to a person and his emotions in various aspects of his life. This applies to both cultural objects (museums) and sacred and utilitarian ones.

Keywords: Modern architecture, Museum, Eco-architecture, Skyscraper, Religious architecture

1. Introduction

Modern architecture is the architecture of the 21st century. No one style dominates; today's architects work in a dozen different styles: from postmodernism and high-tech architecture to highly conceptual and expressive styles reminiscent of large-scale sculpture.

Common to the different styles and approaches is the use of very advanced technology and modern building materials, such as tubular construction, which allows for taller, lighter and stronger

buildings than in the 20th century, as well as the use of new technologies on computers in three dimensions and building with greater accuracy and speed.

Modern buildings are designed to be noticed and surprised. Some have concrete structures turned into glass or aluminum screens, highly asymmetrical facades, and cantilevered sections hanging above the street. Skyscrapers are twisted or broken into crystal-like faces. Facades are designed to flicker or change color at different times of the day.

While the major attractions of modern architecture in the 20th century were mainly concentrated in the United States and Western Europe, modern architecture is global; important new buildings were built in China, Latin America, and especially in the Persian Gulf countries in the Middle East; The Burj Khalifa in Dubai was the tallest building in the world in 2016, while the Shanghai Tower in China was the second tallest.

Most of the landmarks of modern architecture are the work of a small group of architects working on an international scale. Many were designed by architects prominent in the late 20th century, including Mario Botta, Frank Gehry, Jean Nouvel, Norman Foster, Yeo Ming Pei, and Renzo Piano, while others are the work of a new generation born during or after the Second World War II, including Zaha Hadid, Santiago Calatrava, Daniel Libeskind, Jacques Herzog, Pierre de Meuron, Rem Koolhaas, and Shigeru Ban. Other projects are the work of collectives of several architects, such as UNStudio and SANAA, or giant multinational agencies such as Skidmore, Owings & Merrill, with thirty associate architects and large teams of engineers and designers, and Gensler with 5,000 employees in 16 countries.

2. Object and subject of research

The object of research: modern architecture.

The subject of research: various typologies of modern architecture (museums, religious architecture, skyscrapers, and eco-architecture).

3. Target of research

The target of the research: the study of modern architecture of various typologies and identification of the main direction of development.

4. Literature analysis

The analytical work of offices/sites of architects of different generations presented below was carried out. [1-16]

5. Research methods

The method of genetic analysis involves the study of the general and typological dynamics of the research object, the method of analogy, made it possible to create a comparative analysis of trends in the formation of the studied objects, classification of actual material, structural and qualitative analysis of documents

6. Research results

Museums

Some of the most striking and innovative works of modern architecture are in art museums, which are often examples of sculptural architecture and are signatures of the greatest architects. The Quadracci Pavilion at the Milwaukee Art Museum in Milwaukee (fig. 1; 1), Wisconsin was designed by Spanish architect Santiago Calatrava. Its structure includes a movable, wing-like sole that opens

to a 66m wing span during the day, folding into a tall, arched structure at night or in inclement weather. [1]

Polish-born American architect Daniel Libeskind (born 1946) is one of the most prolific contemporary museum architects. He was a scientist before he started designing buildings, and was one of the early proponents of the architectural theory of deconstructivism. The exterior of his Imperial War Museum North in Manchester, England (2002) has an appearance that resembles, depending on the light and time of day, huge and broken pieces of earth or armor, and is said to symbolize the destruction of war. [2] In 2006, Libeskind completed the Hamilton House of the Denver Art Museum in Denver (fig. 1; 2), Colorado, consisting of twenty inclined planes, none of them parallel or perpendicular, covered with 230,000 square feet of titanium panels. Inside the walls of the galleries are all different, slanted, and asymmetrical. [3] Libeskind completed another striking museum, the Royal Ontario Museum in Toronto, Ontario, Canada (2007), also known as Crystal, a building shaped like a broken crystal. Libeskind's museums were admired and criticized by critics. The architectural critic of the "New York Times" Mykola Oroussoff, admiring many features of the Denver Art Museum, wrote: "In a building with sloping walls and asymmetrical rooms - tortured geometries, generated by purely formal considerations, it is almost impossible to enjoy art."

The De Young Museum (fig. 1; 3) in San Francisco was designed by Swiss architects Herzog & de Meuron. It opened in 2005, replacing an older structure badly damaged by the 1989 earthquake. The new museum was designed to blend in with the park's natural landscape and withstand strong earthquakes. The building can move in three steps (91 cm) on sliding ball bearings and sleeve dampers that absorb kinetic energy. [4]

Zentrum Paul Klee (fig. 1; 4) Renzo Piano is an art museum near Bern, Switzerland, located next to the autobahn in the Swiss countryside. The museum blends into the landscape, taking the form of three hills made of steel and glass. One building houses the gallery (which is almost entirely underground to protect Klee's fragile drawings from sunlight), while the other two hills house the education center and administrative offices. [5]

Center Pompidou-Metz (fig. 1; 5), Metz, France, (2010), a branch of the Center Pompidou Center for Contemporary Art in Paris, was designed by Japanese architect Shigeru Ban, who won the 2014 Pritzker Prize for Architecture. The building's most dramatic feature; it is a 90 m (300 ft) wide hexagon with a surface area of 8,000 m² (86,000 sq ft) consisting of sixteen kilometers of glued laminated timber intersecting to form hexagonal wooden blocks resembling a Chinese cane pattern with curves and counter-curves throughout the building, particularly with three galleries. The entire wooden structure is covered with a white fiberglass membrane and a Teflon coating that protects against direct sunlight but allows light to pass through. [6]

Renzo Piano's new Whitney Museum of American Art (fig. 1; 6) in New York (Renzo Piano, 2015) took a very different approach from Frank Gehry's sculptural museums. The Whitney has an industrial-looking facade that blends into the neighborhood. Michael Kimmelman, an architecture critic for The New York Times, called the building "a mishmash of styles" but noted its similarity to the Center Pompidou in Paris, as it blended with the public spaces around it. "Unlike so-called big-name architecture," Kimmelman wrote, "this is not some fancy trophy building into which all the practical materials of a workers' museum must be installed." [7]



Fig.1. Image of museums: 1 - the Milwaukee Art Museum in Milwaukee; 2 - Art Museum in Denver; 3 - The De Young Museum in San Francisco; 4 - Zentrum Paul Klee; 5 - Center Pompidou-Metz; 6 - Whitney Museum of American Art in New York.

Skyscrapers

The skyscraper (commonly referred to as a building more than 40 stories tall) first appeared in Chicago in the 1890s and was primarily an American style in the mid-20th century, but in the 21st century, skyscrapers have been found in nearly every major city in every continent. A new construction technology, the tube-frame structure, was first developed in the United States in 1963 by civil engineer Fazlur Rahman Khan Skimror, Owings, and Merrill, which allowed super-storied buildings to be constructed that required fewer interior walls, had more window space, and could better resist lateral forces such as strong winds.

The Burj Khalifa in Dubai (fig. 2; 1), United Arab Emirates, is the tallest structure in the world, standing at 829.8 m (2,722 ft). Construction of the Burj Khalifa began in 2004, and the exterior was completed 5 years later in 2009. The primary structure is reinforced concrete. The Burj Khalifa was designed by Adrian Smith, then Skidmore, Owings, and Merrill (SOM). He was also the lead architect of the Jin Mao Tower, the Pearl River Tower, and the Trump International Hotel and Tower. [8]

Adrian Smith and his firm are the architects of the building that will replace the Burj Khalifa as the world's tallest building in 2020. The Jeddah Tower in Jeddah, Saudi Arabia will be 1,008 meters (3,307 feet) tall, making it the tallest building in the world and the first building to be more than one kilometer tall. Construction began in 2013.

In London, one of the most prominent modern landmarks is 30 St Mary Ax (fig. 2; 2), known as The Gherkin, designed by Norman Foster (2004). He replaced London's Millennium Tower with a much taller design previously proposed by Foster for the same site, which would have been the tallest building in Europe but was so tall that it would interfere with flights at Heathrow Airport. The Gherkin's steel frame is integrated into the glass facade, giving it the striking appearance of an elongated Russian Easter egg. [9]

The tallest building in China as of 2015 is the Shanghai Tower (fig. 2; 3) by the American architecture and design firm Hensler. It is 632 meters (2,073 ft) tall, with 127 floors, making it the second tallest building in the world in 2016. It also features the fastest elevators, reaching speeds of 20.5 meters (40 feet) per second or 74 kilometers per hour. [10]

Most skyscrapers are designed to express modernity; the most notable exception is Abraj al-Bayt, a complex of seven skyscrapers built by the Saudi Arabian government to accommodate pilgrims to the holy shrine of Mecca. The centerpiece of the group is the Clock Tower Tower Makkah Palace Hotel, with its Gothic Revival tower; it was the fourth tallest building in the world in 2016, at 581.1 meters (1,906 ft). [11]



Fig. 2. Image of skyscrapers: 1 - The Burj Khalifa in Dubai; 2 - 30 St Mary Ax; 3 - the Shanghai Tower.

Religious architecture

Surprisingly few modern churches were built between 2000 and 2017. Ecclesiastical architects, with few exceptions, have rarely shown the same freedom of expression as architects of museums, skyscrapers, and other large buildings. The new cathedral for Los Angeles, California (fig. 3; 1) was designed in a postmodern style by Spanish architect Rafael Moneo. The previous cathedral was seriously damaged by an earthquake in 1995; The new building was specially designed to withstand such impacts. [12]

The Cathedral of the Northern Lights (fig. 3; 2), founded in Denmark by the international firm Schmidt, Hammer, and Lassen, is located in Alta, Norway, one of the northernmost cities in the world. Their other important works include the National Library of Denmark in Copenhagen. [thirteen]

Vrindavan Chandrodaya Mandir (fig. 3; 3) is a Hindu temple in Vrindavan in the state of Uttar Pradesh in India that was under construction in late 2016. Architects - InGenious Studio Pvt. Ltd. from Gurgaon and design studio Quintessence in Noida, India. The entrance to the traditional Nagar style of Indian architecture, and the modern glass-fronted tower up to the 70th floor. At 700 feet (213 meters or 70 stories), it will be the tallest religious structure in the world. [14]



Fig. 3. Image of religious architecture: 1 - cathedral for Los Angeles, California; 2 - The Cathedral of the Northern Lights; 3 - Vrindavan Chandrodaya Mandir.

Eco-architecture

A growing trend in the 21st century is eco-architecture, also called sustainable architecture; buildings with features that store heat and energy and sometimes generate their energy through solar panels and windmills and use the sun's heat to create solar hot water. They can also be built with their sewage treatment and sometimes rainwater harvesting. Some buildings integrate garden green walls and green roofs in their construction. Other features of eco-architecture include the use of wood and recycled materials. There are several green building certification programs, the most well-known of which is the Leadership in Energy and Environmental Design or LEED rating, which measures the environmental impact of buildings.

Many urban skyscrapers, such as 30 Saint Mary Ax in London, use a double skin of glass to save energy. The double skin and curved shape of the building create air pressure differences that help keep the building cooler in the summer and warmer in the winter, reducing the need for air conditioning. Example: Sfn: Hopkins

BedZED, designed by British architect Bill Dunster, is a community of eighty-two houses in Huckbridge, near London, built according to eco-architecture principles. Houses face south to take advantage of the sunlight and have triple glazing for insulation, much of the energy comes from solar panels, rainwater is collected and reused, and cars are confused. BedZED successfully reduced electricity consumption by 45 percent and hot water consumption by 81 percent from the city average in 2010, although a successful woodchip heat generation system proved elusive and complex. [15]

CaixaForum Madrid - Museum and Cultural Center Paseo del Prado 36, Madrid, Swiss architects Herzog & de Meuron, built between 2001 and 2007, is an example of both green architecture and recycling. The main structure is an abandoned brick power station with floors built on top. The new floors are encased in oxidized cast iron, which has a rusty red color like the bricks of the old power station below. The building next to it has a green wall designed by French botanist Patrick Blanc. The red top of the upper floors contrasts with the plants on the wall, while the green wall harmonizes with the botanical garden next to the cultural center. [16]

Unusual materials are sometimes recycled for use in eco-architecture; these include jeans made from old blue jeans for insulation, as well as panels made from paper flakes, baked earth, flax, sisal or coconut, and especially fast bamboo. Lumber and stone from demolished buildings are often reclaimed and reused for flooring, while hardware, windows, and other parts from older buildings are reused.

Research results: the diverse typology of modern architecture (museums, skyscrapers, religious architecture, and eco-architecture) and the main architects of different generations and their influence on world trends were studied.

Prospects for the further development of research: it is possible to conduct a more detailed analysis of other typologies in the context of modern architecture (for example, choose also bridges, housing, universities, and libraries).

8. Conclusions

Modern architecture today tends to find non-standard forms and solutions at the expense of new materials, as well as conscious environmental responsibility. These basic principles apply to a wide variety of typologies (museums, skyscrapers, religious architecture, and eco-architecture were considered), styles, and locations (on different continents).

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