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Architectural symbolism in tradition and modernity

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Abstract. The article considers the architectural form and its components: physical, artistic, symbolic forms. Symbolism in architectural form has been used since antiquity as a way of transmitting certain sacred information in an associative way. The symbolism of the architectural form has traditionally been addressed at several levels: digital / numerical symbolism; graphic characters; conceptually - planning and conceptual-spatial levels. Modern architectural objects partially use the traditional methods of symbolism and are more characterized by the use of associations, metaphors and direct imitation. All techniques are illustrated both by the existing architectural objects, classical and modern, as well as by the example of architectural competitions on space exploration Marstopia, Moontopia, Moon Trip.

Introduction

The organization of the architectural space is determined both by its functional expediency, by the correspondence to the social and technological processes for which it is intended, and by shaping according to architectural and artistic canons. In an architectural form, space, image and function are inextricably linked.

Any architectural structure is a combination of volumetric and spatial forms, a system of interconnected spaces and forms. Their artistic interaction is the basis of architectural composition.

The architectural form (volume and space) has several levels:

- physical form;
- art form;
- symbolic (figurative) form;
- energy form.

An architectural form (volumetric and spatial) as a physical form has the properties that characterize it as a dimensional category. An architect works with size, geometric appearance, proportionality, silhouette.

Artistry of the architectural form is achieved by such compositional means of expression as plasticity, dynamism, scale, rhythmic structure.

The symbolic form is the most complex means of expression, solved by the geometric form associativity. There are many architectural objects where the symbolic image is fundamental. These are the religious buildings, memorial buildings, for example.

Decryption of the architectural form occurs through the linear contours and silhouette perception. Even in the absence of the filling mass, the shape of the form is preserved if the main nodes of the shape are fixed: for example, a frame or volume pyramid always remains a pyramid.



The figuratively associative characteristics of simple “eternal” figures and numbers, graphic symbols and lines, colors and lights have been developed long ago and are essentially a traditional, widespread technique for expressing symbolism. So, the temples of the Sun, the Moon, the goddess of the Earth Vesta were made round. The vertical is a sign of the connection between different levels of being, the pyramid is the idea of eternity, ascension to the Higher.

The creation of a symbolic form is the most complex level of the architectural creativity and difficult to understand, therefore it is always accompanied by the picturesque and sculptural images that explain the meaning of the architectural form in a simpler language.

1. Symbols of architectural form

The symbolism of the architectural form is solved at several levels:

- digital / numerical symbols;
- graphic characters;
- conceptually - planning level;
- conceptual-spatial level;
- associations;
- metaphors;
- imitation.

Architectural objects can contain both single and several methods of creating form symbolism, complemented by the pictorial and sculptural images.

1.1. Digital / Numerical Symbols

Numbers and numerals have an ancient sacred symbolism: a unit denotes the creation source, 2 - the duality of the world and the opposites' unity, 3 - the symbol of the trinity, as well as the union of mind, body and soul. The number 5 is a symbol of a man, and according to Pythagoras these are the four primary elements - Earth, air, fire and water, pierced by ether. Numbers 7, 12 are the most common. These are the 7 steps of the ziggurat, 7 celestial planes, 7 and 12 planets, 12 zodiac signs that were projected onto our calendars.

Numbers can also be presented as the proportions, relations of the volume sides, reflecting the symbolism of the number “pi” ($\pi = 3,1415\dots$), “Golden Section” ($\varphi = 1,618\dots$), underlying the sacred geometry of the universe. So, in the proportions of the Cheops pyramid according to the research of P. Smith and other researchers, the number “pi” is 3.1415 [1].

Numbers can be used as specific matches for the key dates and values using a direct match. The new Church of the Resurrection of Christ in Kubinka (architect D. Smirnov, 2020) reflects with its numerical series the key dates of the Great Patriotic War of 1941-1945. So, the diameter of the drum of the main dome is 19.45 meters, which corresponds to 1945 - the end of the Great Patriotic War. The height of the belfry is 75 meters - a symbol of the 75th anniversary of the World War II end in 2020.

The height of the small dome is 14.18 meters, it is 1418 days and nights of hostilities. The “Memory Road” gallery has the same symbolism with a length of 1,418 steps in memory of those days and nights during which the fighting lasted. [2].

1.2. Graphic symbols.

Graphic symbols - circle, square, triangle, star, spiral - have ancient symbolism. The figuratively associative characteristics of figures and lines, simple “eternal” figures have been developed long ago and are essentially traditional. The temples of the Sun, the Moon, the goddess of the Earth Vesta were made round, the rest were rectangular. The symbolism of stars is interesting. These are the ruby stars of the Kremlin, and the Wind Rose, and cities - fortresses in the form of stars, which are found in many in all parts of the planet. This is a reflection of the nature fractality, its repetition in architectural structures and decor.

The star's geometry is formed in snowflakes during crystallization of water during cooling, in sand grains when exposed to sound of different frequencies, and the number of generated rays depends on the

sound frequency. Under the influence of vibration (sound), the smallest particles of sand on a sheet of glass are combined into various patterns with beam symmetry, forming geometric ornaments. Changing the frequency of sound qualitatively changes the nature of the pattern and is a manifestation of the nature fractality. In physics, this phenomenon is better known as the Chladni figures [3].

A powerful natural symbol has found distribution in decorative patterns of almost all peoples. The geometry of the star carries a powerful energy charge, being an element of sacred geometry, according to the patterns of which the Creator builds the whole variety of Nature forms. It is no coincidence that fortresses - stars were so common in antiquity. It is no coincidence that the use of a protective pattern (stars, spirals) on folk clothes.

Star-shaped architectural structures are rare today. The Central Theater of the Russian Army in Moscow (1934–40, architect K. Alabyan, V. Simbirtsev) in plan is a five-pointed star, in the center of which is an auditorium with 1,520 seats (Figure 1). The rays of the five-pointed star indicate the direction to the major transport hubs of the capital. The symbol of the 5-pointed star is used here in its literal sense, as the symbol of stars on epaulettes and stars - amulets on the Kremlin walls.

The Pentagon (The Pentagon) - the largest office building in the world and a symbol of the US military power (1941-43, architect George Bergstrom) also has the appearance of a pentagon, but a different, not radiation shape.

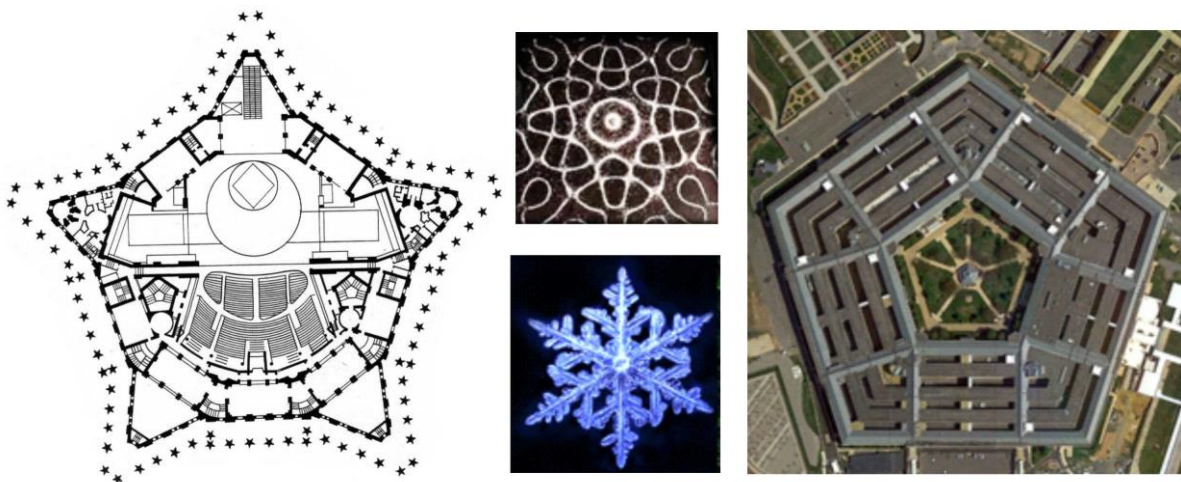


Figure 1. The Russian Army Theater in Moscow and the Pentagon are different forms of pentagons. Natural forms of the geometry of stars: water (snowflake), sound (Chladni figure).

1.3. Conceptual and planning level of symbolism.

Conceptually, the planning level is mediated by symbolism, mythology, astronomy and is embodied in the planning structure of the building.

Ancient architectural structures were “strung” with their axis on the Sun movement and the key dates of the solstices. The Temple of Amon - Ra in Karnak (XVI-VII centuries BC) is the most characteristic example of building the structure of a building along the axis of the winter and summer solstices’ key dates. The longitudinal axis of the building is oriented towards the Sun setting on the summer solstice, illuminating the whole suite of halls with the rays of the Sun to the sanctuary itself. At the same time, this system also worked at sunrise on the winter solstice (Figure 2) [4]

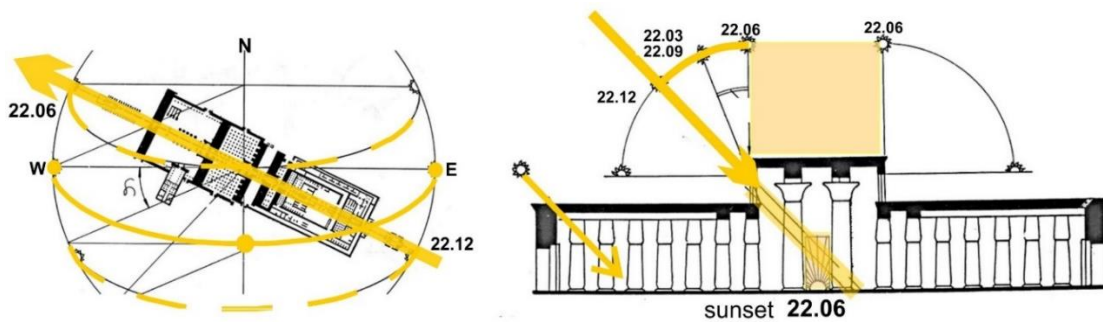


Figure 2. The Temple of Amun-Ra in Karnak structure's construction on the key dates of solstices.

The symbolism of the columns' capitals in the form of closed and open lotus petals reflects the idea of the solar illumination dynamics, according to the Sun's rays' movement geography: accentuation of the summer solstice day by the portal, the rays' transmission in the sanctuary, different height of the halls and their illumination as a reflection of the Sun height dynamics and the intensity of daylight (Fig. 2).

The solar plan was embodied on the architectural structures of the Earth, the space plan was realized by the projection of the stars. The ancient peoples considered the Earth as a reflection of the sky "image", followed the projection of the Sun on the Earth, as well as other luminaries and constellations. What the ancient Egyptians knew for a long time and used in the construction of the great Giza pyramids, contemporaries only learned in 1994 thanks to the rediscovery of R. Buwell and E. Gidbert: the relative position of the Giza pyramids and the Nile River corresponds to the stars' arrangement in the belt of Orion and the Milky Way (Figure 3) [6].

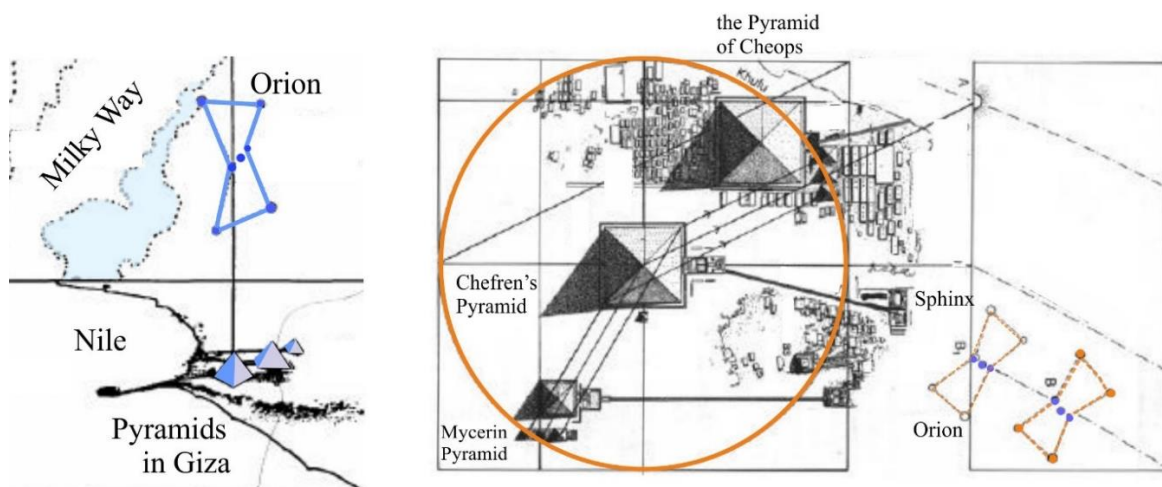


Figure 3. Correspondence of the great Egyptian pyramids of Giza location and the stars location in the belt of Orion. Nile - as a projection of the Milky Way [6].

1.4. Conceptual and spatial symbolism

A system of interconnected spaces and forms can express a certain model of the universe, both the earthly plane and the universe. Thus, the religious buildings were built, reflecting the idea of the temple as a world. The temple in its volumetric-spatial structure symbolically expresses the model of the universe, adopted in this denomination. In Orthodoxy, space is divided into the narthex (the prototype of hell, the world of the unbaptized), the main hall (the prototype of the earthly world), and the altar (the prototype of heaven) and projects the symbol of an equilateral cross - with a powerful vertical connection with the sky. A man talks to the Creator directly, without intermediaries. The Catholic church also reflects such a

structure, but in different proportions. In separate plans, the symbol of the “tree of life” is clearly traced - the image of the planet Earth consciousness. The connection of Man with the Creator is not direct here, through the intermediary - the clergyman.

The difference between the Catholic and Orthodox canons reflects a very deep symbolism of the attitude towards the universe: the Orthodox church has a centric cross-dome system with the head of the dome, and the Catholic church has a linear three-nave with the head of the altar. In this vein, the vaults and domes, with their dominant position in the architectural space, the light streaming from above and the painting of the Higher planes of being (Heaven), play a key role (Figure 4).

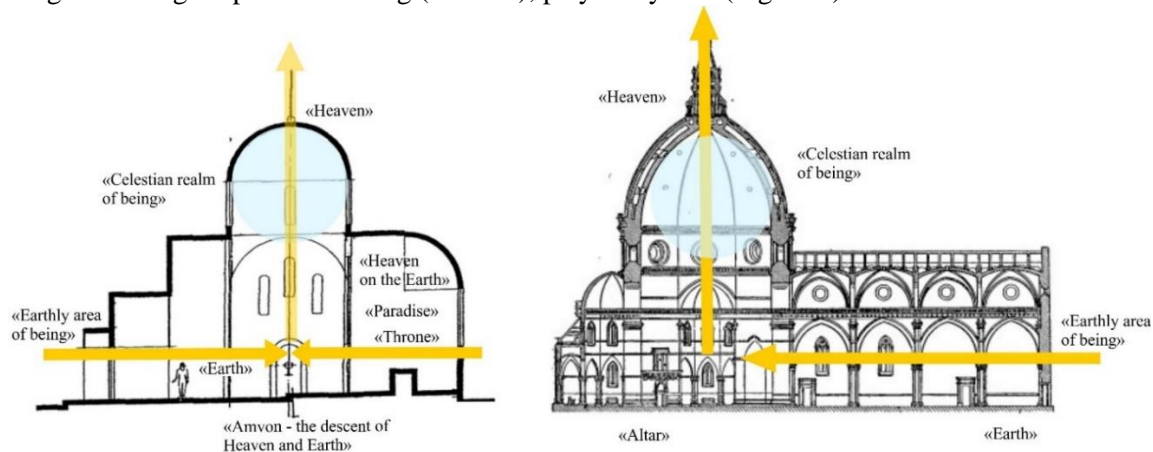


Figure 4. The difference between the Orthodox and Catholic models of the universe in the churches' spaces symbolism

A completely different philosophy with pre-Christian temples, for example, with the Pantheon (Pantheon) - the Temple of all the gods of Ancient Rome (126 AD) with the equality of the seven main Roman gods - Jupiter, Neptune, Venus, Mercury, Mars, Saturn and Pluto. The walls are divided into 2 levels, the lower one is divided into 7 equal niches corresponding to 7 Gods. The same 7 Gods are projected onto separate horizontal levels of the inner surface of the dome, symbolizing the geocentric system of Ptolemy with the Earth in the center of the world. The sequence of planets of the Archimedes times was different from the modern one: Moon, Mercury, Venus, Sun, Mars, Jupiter, Saturn.

The sphere fits into the volume of the temple - the symbol of the Earth, the diameter of the sphere and the dome are the same and make 43.3 meters. The Sun moves around the Earth, its light streams through the oculus - a round open hole in the dome with a diameter of 9 meters, representing the circle of time. The sun simultaneously works like a sundial. The oculus symbolizes the Sun, a sphere inscribed inside - the Earth, around 7 Gods. Together with the Sun and the Earth, the Pantheon includes the number 9, which is repeated in the size of the oculus, and the number 7 - the seven Gods - in the height of the double bronze doors that open the entrance to the temple (Figure 5). The researchers mention that at exactly noon on April 21, the rays form a straight column of light, but this date does not coincide with any astronomical date. The Pantheon still has a lot of symbolism that is hidden from us, which leaves great opportunities for the researchers.

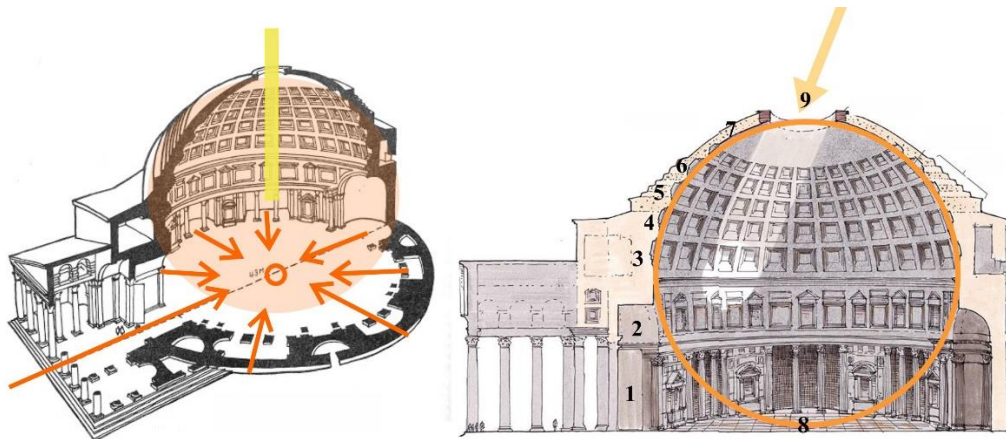


Figure 5. Pantheon - a symbol of the geocentric system of Ptolemy with the Earth in the center of the world

1.5. Modern techniques of architecture symbolism

Modern architectural solutions partly use the traditional methods of symbolism and use more association, metaphor and imitation. Symbolic architecture today is quite rare and is implemented in projects by Daniel Libeskind and in the architecture related to the theme of astronautics.

The architectural volume of the Imperial War Museum of the North, Trafford, Manchester (1998-2002) symbolizes the planet Earth, broken in the process of endless wars into 3 parts (fragments), assembled here together. High Volume - Air accentuates the entrance and represents a multi-luminous space with flying weapons of war - airplanes, etc. The horizontal fragment of the Earth with its curved outline imitates the Earth-ball and includes the exhibition space. The volume (splinter) of water adjoins the water, where a military vessel is moored (Fig. 6).

The symbolism of the Jewish Museum in Berlin (architect Daniel Libeskind) becomes clear when you are in the interior. The diagonal stripes imitate the cross-glued windows, which were made in such a way that during bombing the blast wave would not break the windows or, at least, to reduce the fragments' breakage. Light stripes on the black ceiling imitate the light of searchlights in the dark sky, looking for the military aircraft.

These are the two different architectural objects of our time, using associativity, metaphors, on the one hand, and direct imitation. The non-traditional use of symbolism is interesting, which itself is very symbolic in the hands of the deconstructivism master, destroying the traditional algorithm of architectural form.



Figure 6. Symbolism in the works of D. Libeskind. [Daniel Libeskind]. The use of metaphors and direct imitation in the Imperial War Museum of the North (Imperial War Museum North) and the Jewish Museum in Berlin (Jewish Museum Berlin).

In the modern world, symbolism in architecture has become in demand in connection with the theme of astronautics, in planetariums, observatories, space museums and scientific and space centers. The era of space exploration started on April 12, 1961, when the world's first space flight by USSR pilot-cosmonaut Yu. A. Gagarin was made on the Vostok spacecraft. The world's first museum of the astronautics history was opened in 1967 in the city of Kaluga, which is also very symbolic. Kaluga is the birthplace of K. E. Tsiolkovsky, a Russian philosopher and inventor, the founder of theoretical cosmonautics and the idea of using the multi-stage rockets for flights into space.

Cosmonautics museums use the technique of imitation, direct repetition of elements related to the space exploration: planets, elements of rockets, planes, etc.

The Cosmonautics Museum in Kaluga (architect B. G. Barkhin) symbolizes the firmament breakthrough of the Earth by the rocket's nose taking off. The horizontal plates of volume with their mass personify the effort of mankind to overcome gravity and the power of a jerk into space (Figure 7).

The Moscow Memorial Cosmonautics Museum is located at the base of the Space Conquerors Monument and uses the direct citation of a rocket taking off. The idea of creating a museum at the monument's base belonged to the General Designer S.P. Korolev (Figure 7).



Figure 7. Cosmonautics Museum in Kaluga with a planetarium, memorial museum of cosmonautics in Moscow and the exhibition pavilion of astronautics at the Exhibition of Economic Achievements in Moscow.

From the point of the architectural symbolism techniques' implementation, the international architectural competitions on space exploration are interesting. So, "Marstopia", "Moontopia" were devoted to the topics of Martian and lunar colonization in terms of architecture and design. Within the framework of the competition "Moon Trip / Moonlight Excursion", the task of creating a space research center, in particular for children and adolescents, was solved in order to inspire them to explore and conquer space [7].

In fact, all the Moon Trip competitive works were to some extent presented in a symbolic way, reflecting the planets of the solar system, directly to the Moon, the possible forms of earthly colonies on planets, the image of a spaceship, from association to quoting forms.

The winners of the competition presented the MOONTRIP Interactive Space Education Center with an unusual architecture, the outline of the silhouette and the shape of which laid the trajectory of the Apollo 11 between the Earth and the Moon (Figure 8). The Earth and the Moon, represented by spheres, and the simplified trajectory of the spacecraft, read by the contours in the silhouette and in the interior, have become a symbolic basis for architecture (Figure 9).

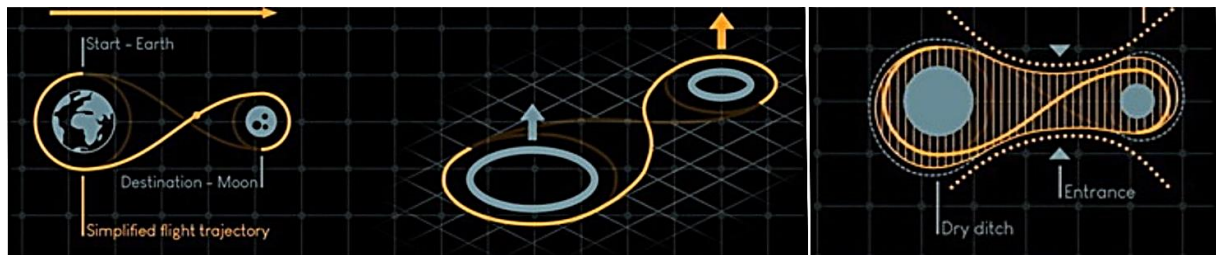


Figure 8. The Apollo 11 trajectory between the Earth and the Moon.

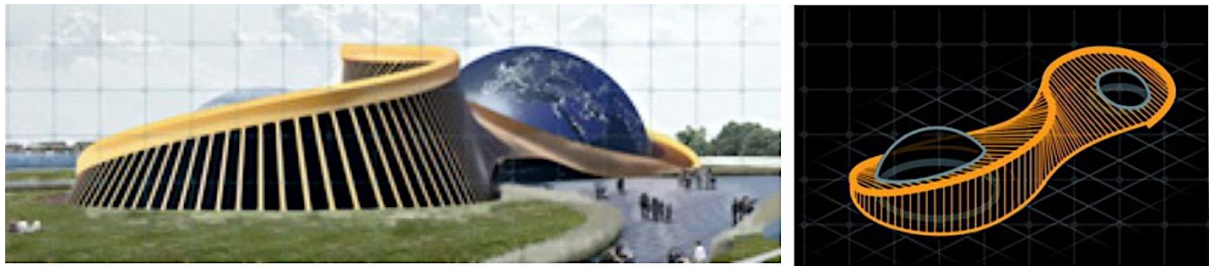


Figure 9. The Earth and the Moon, represented by spheres, and the simplified trajectory of the spacecraft, read by the contours in silhouette, have become a symbolic basis for architecture.

Summary

Architecture has its own specific language, which is by no means identical with the language of literature, music, sculpture, and painting. Architecture is a system of functional space organization, artistic organization of form and unusually powerful symbolism, image. The symbolic decision of the architectural forms has long been considered the prerogative of the past, classical and ancient architecture. However, modern architectural projects and buildings demonstrate a new stage of architectural symbolism, using both classical techniques and finding a completely new modern symbolic language.

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