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CONTINUATION AND NOVELTY IN EUROPEAN ARCHITECTURE – A HISTORY OF CHANGES

The paper summarizes research on connections among function, construction and form in monuments of European architecture in the subsequent historical periods. It presents, against the background of external situation conversions and changes of interrelations between the components of Vitruvian Triad.

Keywords: development periods in architecture, new solutions, function, construction, form, adaptation, transformation, permeating

Impulses which caused a series of transformations leading to the formation of a new trend, a new style and a new period in architecture resulted from the reevaluations of one of the components of the Vitruvian Triad. The rising requirements of evolving functions, the causative force in the creation of every architectural object, involved constructional solutions following these requirements which influenced esthetical reevaluations. Such a sequence of changes did not always take place. The adjustment of functions to new needs was realized in two manners: the adaptation of old, traditional solutions and the appearance of a new type of objects. Their limitations were the technical possibilities of epochs, whereas their changeable values were the binding esthetical canons [1]. The area of the interaction of the three presented factors is the zone of modifications. It has been the area of the activeness of the vanguard and inventors regardless of an epoch or a place.

Out of necessity, the following survey is of Eurocentric character and is limited to the features of edifices which came into existence in the origin of

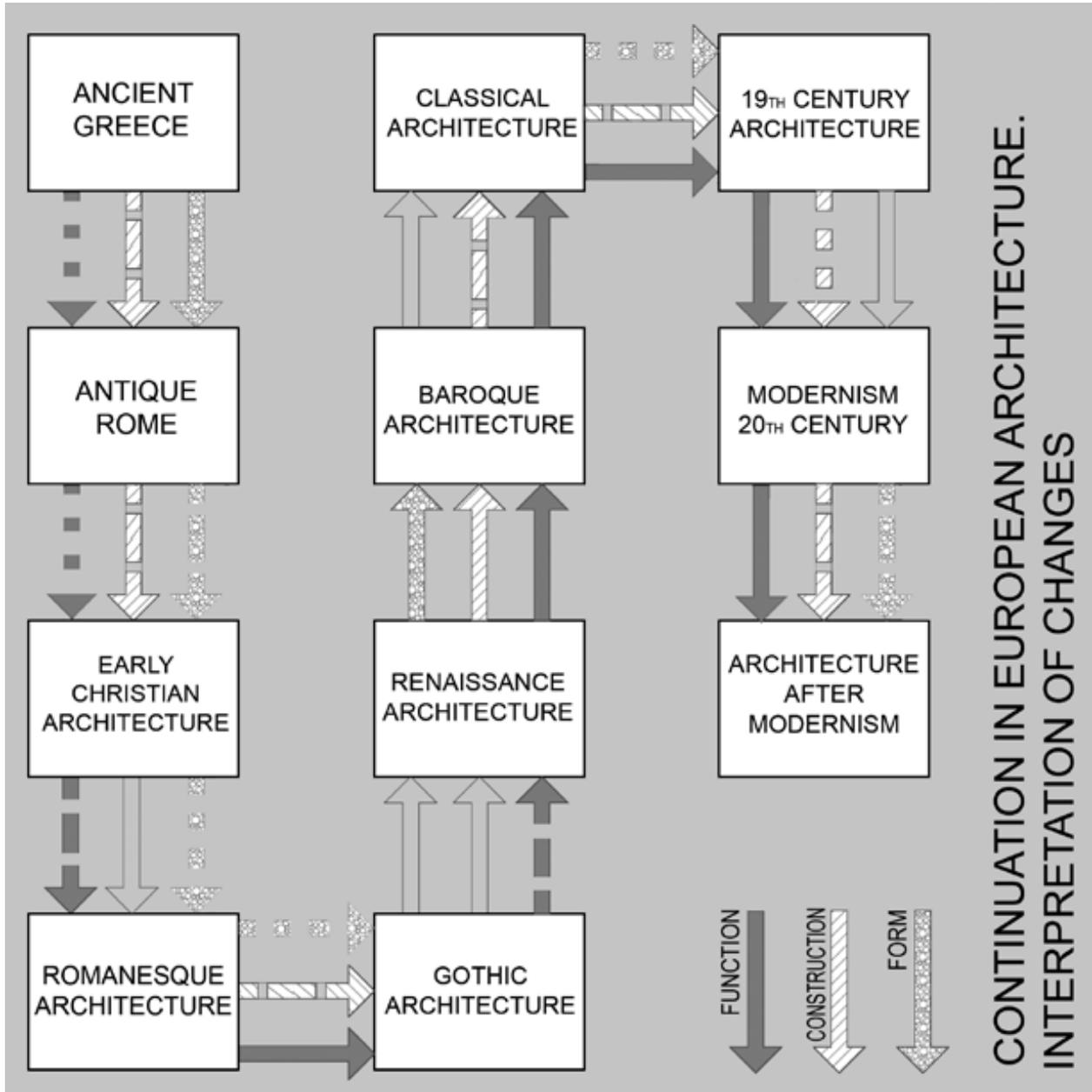
each of the trends. According to the author, an analysis of these elements describes the appearance of new phenomena in the development of architecture in the best manner.

In the prime of the fifth century, the architects of ancient Greece created monumental edifices with a uniform type of construction and a similar esthetical canon. Increasing the scale and broadening the functions of edifices was done by copying the layouts of columns, beams and walls. The array of smart edifices in a city was restrained so such a solution sufficed, while three esthetical solutions – orders appeared in various circles of ancient Greece. The form of edifices resulted from the applied construction carefully prepared in accordance with the then idea of beauty and adjusted to the needs of a community. In the following centuries, the architecture of ancient Greece became an important element – only as a form, not as an integral solution [2].

The Greeks create a cohesive concept of edifices whose construction and form, both new and geometrized, satisfy the functional needs of the community

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for which they were raised to a sufficient degree. An esthetical canon is created.

In ancient Rome and the Roman Empire, constructional achievements, new materials and technologies made it possible to erect new edifices satisfying various needs for the widened range of functions – a result of the political and administrative power. The durability of the forms and motifs of a Greek temple, usually in the form of colonnades and the stone décor of edifices created by the Empire, is the only constituent of the continuation of Greek tradition in an altered shape. The leading elements of the development of Roman architecture are original constructional achievements and functional solutions with the continuation of the esthetical concepts of Greek architecture [3].

The innovativeness of Roman construction responds to the brand new functions of edifices on an unheard-of scale, while the principles of their décor are borrowed from the architecture of ancient Greece and simplified.

In the early Christian period, the religious and administrative centres of the Empire were moved outside Rome to Asia Minor and Palestine which gave birth to many trends in the development under the influence of Eastern architecture and art. In Italy, the pauperization of benefactors in the Ravenna circle limited the scale of layouts and Roman constructional solutions, the array of functions and the richness of interior decoration [4]. Roman motifs intermingled with Eastern glazed mosaic and the Arab convention of using ornaments. The impact of barbarian tribes did not pass unnoticed.

East of the Bosphorus, sacral architecture attained an incomparably higher degree of construction (Hagia Sophia) and remained under strong Eastern influences.

In Europe, the early Christian period exploits the existing constructional solutions. The range of

the functions of representative edifices is narrowed in comparison to the Roman period, whereas new esthetical solutions are shaped under the influence of Eastern architecture and the building tradition of barbarian tribes.

A breakthrough time could be seen in Romanesque architecture which was formed on the former grounds of the provinces of the Roman Empire – the continuity of Roman tradition was interrupted and a new quality was created. Social changes after the collapse of the Empire narrowed the needs and created new building workshops. The formation of a new power – the Catholic Church – contributed to the application of some forgotten types of construction (the side, the groined vault and the basilica layout of edifices) for the purposes of temples and monasteries as well as strongholds, castles and scarce public buildings. The area of the former Empire became a virtual laboratory for solving the vaults and constructional layouts of stone temples. Additive bodies and separatism, the rhythm and symmetry of interiors emphasize the key role of construction and define the function which developed the concept of an early Christian basilica enriched with new elements. Educational ornaments were exhibited and modelled after the Roman style [5].

Romanesque constructions include an innovative search for modular constructions necessary for the creation of hierarchized functions. It concerns both sacral and secular building. The form of edifices responds to the need for affiliation and safety, whereas detail results from the Roman tradition.

The innovativeness of the Gothic construction resulted mostly from the solutions of vaults. In France, where they evolved from Romanesque forms, they were more and more extensive and steeple-shaped owing to the framework stone construction [6]. The mysticism of this epoch originated a constructional search and influenced the shape of the esthetical

canon of a luminous Gothic temple. The new construction opened unprecedented esthetical possibilities and the free arrangement of projections [7]. The medieval creators became fascinated with new forms imposed by the construction and followed its stylistics – the richness of forms and the uniformity of Gothic detail. The concept of sacral architecture was creatively used in numerous secular edifices of that period.

The Gothic construction is a new solution. Its flexibility inspires the form of the bodies of edifices as well as rich ornamentation. The array of functions is gradually extended.

In the Renaissance, the secular patronage was separated and strengthened as a result of social transformations. Everyday life required framing. The adopted ancient models were characterized by geometrical dependences and ornamentation inspired by ancient art. The Renaissance architects did not create any breakthrough constructions. In churches, palaces and municipal edifices, they skillfully used some well-known solutions in a manner which facilitated functional diversification and the creation of edifices for new needs [8].

The wide array of new, mostly secular functions explores Roman constructional solutions. The form of edifices creatively refers to antiquity through proportions, rhythms, symmetry and stylized ornamentation.

In Catholic Europe, baroque was a creative continuation of the achievements of the Renaissance. The stabilization of countries, the development of monarchies and the formed social hierarchy were conducive to the development of architecture: municipal and private buildings serving culture, entertainment, education and health were raised. An emphasis was put on beauty understood as richness, expression and motion. The richness of a form became the elementary guideline in that period. Monumentality was produced by an increased scale, the multiplication of the forms of articulation, a play of light and shade,

optical illusions as well as surprising esthetical solutions [9]. Political and religious considerations divided Europe and the development of architecture into two.

The diversification of the functions of increasingly large-scale edifices. New esthetics: the richness of décor, the multiplication of ornaments based on the Renaissance pattern. The form of edifices responds to the need for monumentality characteristic of this period. Constructional solutions develop the achievements of the Renaissance.

As a result of a concurrence of events in the world of science, politics, economy and culture, the architects of classicism turned to ancient architecture translating the elementary guidelines of monumental architecture into the language of the 18th- and 19th-century construction: rhythm, symmetry and ornamentation. The functions of edifices were still diversified. However, engineering edifices indicated new functional and esthetical standards. The constructional achievements of that period were of high importance: the introduction of hidden iron in edifices and the use of the first constructional calculations made an introduction to the forthcoming revolution [10]. The application of these materials created favourable conditions for the transformation which was about to happen in the whole of architecture.

The further development of needs, mainly in urban communities, causes the extension of social and technical infrastructure. Double-track esthetics: traditional construction camouflaged with historical forms dominated, whereas new kinds of edifices openly used the potential of technology.

Vanguard 19th-century edifices rose against the background of historicizing, eclectic urban buildings. A formal search resulting from a surfeit of repeated solutions in the face of significant transformations led to the formation of Art Nouveau. Scientific discoveries and technological achievements filtered in the field of fine arts and architecture. Economic changes, in-

dustrialization, social problems commenced a search for cheap and mass solutions in every domain which led to the increasingly wide use of iron, steel and reinforced concrete at the turn of the 19th century. Estheticism shaped by the artistic vanguard almost simultaneously with Art Nouveau was applied in housing in response to the needs [11]. Departing from ornamentation for the sake of the natural texture of a material and from articulation for the sake of a rhythm resulting from the construction and function led to a new esthetical quality. The formation of a function, free from the imperative of symmetry and elementary design [12], made it possible to form the bodies of edifices freely. In many cases, industrial construction became the ground for formal and constructional experimentation, while the function, which was shaped by the technological sequence, inspired solutions from other fields of architecture [13]. After World War II, modernism became the binding trend in Europe and the USA, also for economic reasons. The esthetics of edifices continued the abstractionists' achievements from the early 20th century. The possibilities of reinforced concrete and steel framework were fully used in constructional calculations.

Modernism is a period when function, construction and form create a new, cohesive quality, similarly to ancient Greece. Modernists are more and more adjusted to the specialized needs of functionalism.

In Europe, a reaction to the uniformity of modernism began in the 1970s. Postmodernists at first and then the creators of other trends experimented with the form of an architectural work [14]. Contrary to the previous periods, cultural changes caused openness to novelty and uniqueness which resulted in an unprecedented multitude of trends in architecture [15]. Constructional solutions in that period were refined on the basis of new materials and technologies.

The period after modernism is characterized by a variety of forms and sophisticated constructions.

Functions satisfied by architecture are practically unchanged. Novelty is sought for, while shocking with diversity – fashionable.

The analyzed changes are characterized by several regularities. Within the evolution of functions, we can observe a developmental tendency. Characteristically, within one category (a theatre, a stadium, a temple), needs which diversify these objects spring up. The development of constructions was of step-wise character resulting from some breakthrough inventions or the appearance of new materials and technologies. The refinement of each of the historical constructional systems led to larger and bolder solutions as well as borderline anxiety about *Firmitas*. The pursuit of “beautiful” architecture reflected cultural transformations: returning interpretations of esthetical concepts filtered through new technical possibilities.

Impulses which caused a series of transformations leading to the formation of a new trend resulted from the reevaluations of one of the components of the Vitruvian Triad bringing about changes in the remaining ones. Therefore a quest for satisfying esthetical and constructional solutions as well as a response to the patrons, users and architects' needs in each of the presented periods proceeded in a different way.

Configurations of the elements of the Vitruvian Triad, as carriers stimulating new solutions, were different. Their main sources were the transformations of civilization and the development of technical possibilities. That is why places where new constructional, functional and formal solutions sprang up were geographically and culturally remote. Their basis was adjustment to local needs.

In the previous decades, we did not witness any breakthrough solutions in the field of construction. No leap requiring the creation of functional solutions for new activities and processes took place. A survey of specialist literature shows that the carriers of novelty

are mostly materials fitting a work with an interesting form which often proves the possibilities of a com-

puter program... Are we in the middle of a new type of reevaluation?

ENDNOTES

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