Material and function: on the specifics of formation in modern architecture

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Abstract. The article considers the architectural creativity preservation problem and its internal meanings and values within the post-industrial society evolution. Architectural shaping as the Constitution spatial experience free accumulation and transmission process is analyzed from the point of view of changing the “material” and “function” ratio in the mass production and culture development context. The structural-functional approach development prospects to the theory architectural principles independent development are evaluated.

Introduction
The topicality of the presented article and its major research problem are directly connected with the architectural science development modern stage both in the western countries and in Russia. The architectural “product” manufacturing internal limit question is keen under the architectural activity subject diffusion conditions being a moment in the contemporary times destructive tendencies general chain. In other words, do we have a right to speak today that the architectural autonomy foundations and the architectural creativity freedom remained unchanged. Does architect act as an artist or as a craftsman today?

Materials and Method
A poet in a certain sense narrating in space shapes and stone of his unique word. At present the architectural creativity as a new shape appearance closest process is deprived of its grounds in the “material” “technology” and activity purposes. The modern architecture practically does not create the space marked experience structures being able to include in its own opened immanent flood the principles of “reading”, metaphorization and codification. At present it is very difficult to find an architectural project or its ready implementation that would create an especial world of meanings. Any modern construction is “read” under the rules of non-immanent architectural grammar. It practically lacks its unique hermeneutics, the circle of interpretations and references. It is not capable to tell itself, to narrate about itself. This utilitarian “exegesis” function is carried out by the post-modern consumers’ society.

It is evident that the formalists structural and functional approach became the newest times essence explanation architectural thinking dominating means both for the architecture in general and for the architectural shaping in particular. It is quite clear and logical under the socio-cultural transformations
conditions of the public life and the human being himself in the epoch of large-scale production development, mass standardized “algorithms and patterns” of thinking ability, behavior and communication, the collective anthropologic experience sacralized semantic layers total destruction in the scientific and technical progress cultivation. “The modern standardization process undermines us and subordinates to itself, – mentions F. L. Write. …Standardization has already become an inevitable necessity, but either as an enemy or as a friend - you can choose \... Mechanization and standardization have already deprived their life craft in all its manifestations… I am concerned, – the writer stressed hereby, – new shapes as the machined production new system expression” [8, p. 54].

Already in the 30-th of the century the French author and architect, the creator of St. Genevieve library and the new reading hall of the National library in Paris, H. Labrouste wrote “…I explain them [my own students], that strength depends rather upon the way the materials are connected than upon their quantity and .. I tell them that they should be based upon the construction itself while choosing the way of finishing… I tell them repeatedly that the art possesses the power to make everything beautiful but I insist on that so that they are absolutely clear that the shape in architecture should always correspond to the function it is intended to” [1, p. 185].

**Results**

Actually, the architecture lost the connection with the ceremonial and the social existence symbolic side defining the construction canons during its whole millennial history of existence starting with the Stonehenge Pyramids creation time until the World War I. Historically the architecture was inseparable from the transcendental measuring of culture. Any construction not obligatorily even directly connected with the religious practices (temple complexes, cathedrals, etc.), in the traditional society either in the eastern civilization (China, India, Persia, Shinto cultural centers) or the classical West, born on the warm Aegean Sea shores, has always been oriented structurally and spatially so that in its morphology geometry, compositional solution would satisfy the common for this time and its “Spirit” requirements of fixing relations between the culture separate bearer, the ordinary individual and the common holistic levels, power, cult-sending social groups, elites.

As well as the art in general, the architecture always executed the most important axiological and target regulating functions. But besides that it *left also their frames* of the creative simple expression will and technical knowledge of its creators acting as the form fixing the iconic and symbolic culture unity, society, means or methods of super-physical measuring objectification of experience and the subsequent correlation of specific bearers-subjects of this given particular civilization level and historical development with it.

**Discussion**

Starting already with the second half of the 19th century and being an active participant of the social exchange in the society, communicative processes became machinery, *a machine*, Construction in Europe, the USA, Russia and other regions of the planet participated in the progress on the market and science basis, it stopped orienting on metaphysical forests of life. “A special role in architecture is played by changes caused by the spirit of time, new tasks, put forward for the construction, at transport and industry and the new constructive solutions possibility at the new construction materials usage: glass – steel – concrete” [4, p. 306]. A man simply relieved the technical power from the creative acquiring necessity and vital space indirect subordination.

Besides, social collisions, revolutions and other processes in the society and the conscience itself caused the cultural evolution earlier unknown factor actualization– an appeared multi–million mass of people. Urbanization, breakage of the patriarchal hierarchical structure, the communicative practices de-sublimation, their de-satiation, considerable simplification, the maximum pragmatism of the mass production forced “to accept” somehow , “to assimilate” the formerly silent majority of the population, to involve into the classified social subject (for instance, national or a state one) orbit. Urbanization processes, cities growth tendencies, subordination of the entire space by them as “the place” of the individual’s existence are inseparable from the mass conscience evolution and its main
bearer. Evidently the domestic scientist V. L. Glazychev is right when he writes that “the uniform urbanization objective process is inevitable. It goes without saying that attempts of individuals or small groups to escape as far as possible from cities influence will continue but this escapism alternative is doomed to being a purely marginal phenomenon. The world is moving to all its population living in cities. The world is as follows: nature reserves, parks, national parks will be enlarged in numbers and in size but this happens simply because their recreation facilities are becoming more interesting for those whose major activity is done in urbane surroundings”. [2, p. 7]. The modern mass culture is a large city citizen culture totally suppressing any vital world individual coding.

This required the creation of living, movement and habituating conditions totally different from the traditional shapes. And the new requirement had been put forward by the 20th century – the new architecture that has to meet current mass requirements and desires to arrange the masses deprived of transcendental firmament and roots. And as Walter Gropius thinks, “it is mistaken to suggest that the architecture will deteriorate due to the residential building constructions industrialization. On the contrary, the building elements standardization will make a positive influence upon the new residences and enterprises uniform nature creation” [3, p. 343]. The architecture uniform nature turns it into a simple production making a final product in industrial scale. Otherwise it will be extremely difficult to meet the current social requirements. To be more exact, it is not possible in principle. We would mention that the modern situation with the solution of the residential problem in Russia and in many other countries of the Old and New World mostly preserves this requirement – to construct cheaper, more and faster, to catching up the demography growth proportion from one hand and the necessity of the strict resources economy (including the intellectual ones required for the new surroundings symbolic acquisition), from the other hand.

The architectural shape essence explanation started to be based upon the new channels’ necessity of the social circulation and lifting search, that was not known either to the architecture or to the art in general into the classical mass. Specific in this respect is the saying of Luis Sallivan, the architect and the author of the end of the 19th century, who tried to substantiate theoretically “the new” aesthetics, where a beauty as a perception is the meeting requirements result and also has a fundamental nature. “Either this is an eagle in the rapid flight, an apple-tree in blossom, a workhorse carrying cargo, a bubbling stream, clouds floating in the sky, and the immortal Sun movement above all these – everywhere and always the shape follows the function” [9, p. 44-45]. He is echoed by E. Mendelson: “The original architectures development initial stage masterpieces shapes are defined by the construction period precision used as a basis and materials grounded also the appearance of all those products of the world-wide importance, allowing to follow without the history mistakes of the mankind development” [6, p. 309].

In connection with these keen trends the attitude to the architecture itself in the society became purely pragmatic based upon the economy and computation grounds, usefulness accessible environment and landscapes maximization efficacy criteria. Meanwhile it would be not correct and not precise historically to limit such criteria argumentation circle by only the science and technologies development. The point is that technical innovations themselves, use of knowledge got experimentally, always followed by the vital world settlement, the natural environment development (for instance, at construction of ancient cities, military and defensive constructions, cathedrals, temple complexes, etc.)

The greatest memorials of the ancient Greek and Roman architecture, magnificent gothic cathedrals of the medieval West and finally the large-scale constructions of the Renaissance and Baroque were first of all based upon the finest and most complicated mathematic calculations, on the profound specialized knowledge of materials composition, methods of their treatment and in combination with complexes of buildings and cathedrals. In this respect the German investigator Kurt Siegel mentions correctly: “Every architectural concept is executed by the specific technical means. The architecture acquires this or that shape with the help of machinery and becomes a material expression of its epoch. Machinery always made influence upon architectural shapes. Always
machinery and new construction materials served architects as a source of the creative inspiration. If there were no machinery – there would be neither Parthenon no Gothic” [4, p. 8]. Even earlier Le Corbusier spoke analogically: “Technical means precede and are the condition of any construction … they define architectural shapes and sometimes they also cause the radical aesthetic reconstruction” [5, p. 76].

From this point of view the architectural thought as far as we can judge by the civilization history in principle always acted in the society architectural armament vanguard. The prominent masters, architects, designers were the most important scientists of their time, encyclopedically combining knowledge in different spheres and perceiving very gently the spiritual rhythm of their time. That is why the scientific progress influence upon the architecture development in the newest time without any doubt is iconic and symbolic. But at present the essence of the past transformations and tendencies defining the peculiar features of the architecture development modeling systems is not limited only by the introduction of new materials, technologies and the estimate modeling systems.

The architectural shape explanations analysis and comparison in particular allows to understand best of all that the worldwide philosophical scientist mood of the newest time, the influence of the science was impressed differently. And namely: metaphors, teleology of space arrangement, symbolic and sense grading and ranging. Exactly via these its properties the architecture expresses not only and the society material and technical progress level but the means of self-understanding, self-identification, self-nomination of the single socio-cultural body. In the subject architectural shape, the mental rooting is read, creating and watching these or that construction. The form does not only limit or defines the architectural mass, but it also fixes in the considerable _defining_ manner a _difference_ as a method institutionalization of especial prospective subjective and rapid subordinating space (and time).

The structural and functionalist aspects got the leading role in the industrial and post-industrial society in the approach to the architectural shape learning and producing because, this very focus allows to get rid of “the excessive” burden of metaphysics and the projects tectonic root symbolic vectors.

In the architectural intuition of our times of our time the change of the “shape” concept by the different constructivism ersatz mostly and consequently is also diluted the self-sufficient immanent quality of the affirmations shape and its self-representativity, remains pure formality and the shape-formation factor analysis. They certainly cause the numerous censures and cynical looks in its direction. Only this alone confirms in itself the absence of reliable own subjective and the architectural history methodological shelter. It is impossible under the existing quite complicated conditions to oppose something informative and solid to the operational constructivists ideology attack of the recent time using the scientifically oriented outlook evident grounds and the absence from the other side of the pragmatic value and usefulness digestible consumers’ attractiveness by the former in the subject presence meditative “Ego” points tension space solutions and fields classical literature semantic “nodes”. In the conscience classical epoch, the architecture was represented by a space plastic _shape of reality_. The newest time metaphors called the space institution shape-forming fundamental strategy into question. The classical principles of the architectural form formation caused the physical space inclusion as the objective prejudices of a human dwelling into the flood of the conscience itself as its _different_; in the world of modern architectural shape a man nearly does not recognize himself.

If architecture is considered only as a certain _product_ of the public production (even if in the widest sense of the word, that was indicated by Marks in his famous passage about the comparison of a “good” beer and the “worst” architect, possessing specific prejudices of its own development, the changes in the principles of activity, planning and designing, but naturally that the factor analysis in particular should give the answers to the basic questions about the architecture essence in the specific cultural surroundings.

This very approach is completely going in line with the methodological contours of the positivistic scientific understanding of this and the other subject. But in the 20-th century not only the natural objects became its subjects but first of all the human being himself, intellect, cultural historical
development, language, psyche, communication, collective vision and off-springs in blossom of the individual self-consciousness (myths, poetry, religion, art, philosophy). Architecture is not an exclusion. From this point of view any object or a piece of architecture in this given case is divided into feasible components, is actually reduced and presented in the form of configuration or structure. The changes are caused by the change of factors, their dynamics or a qualitative growth as well as changes in public expectations and orders.

As the cause of such “genetic” penetration into the subject turns out exhausted by the processes of the architectural object decoration, its shape formation, that is, in other words, its compositions or designing. In this case the point is not even in the procedural origin of such form measurement. As such origin in itself does not manifest anything. A shape as the architectural product image self-organization immanent method via the process is still manifested only as the abstraction requiring the intermediary links number restoration. A shape as an architectural object format is completely grounded. The smallest movements in it or structural changes only reflect factors evolution in themselves. The given statement should be operated extremely accurately. And here is the reason.

Any artifact of human culture (at least truly known to us), any socio-cultural phenomenon, an event or a process is first of all a “child” of its time, the verge of “the epoch spirit”, including the socius level of “the epoch spirit”, including the socius level and the material production base development as the anthropological and cultural genesis basis. The architecture here is not only the example but one of the most evident aspects of growth and progress of “the unnatural” (Marks) continuation of “natural” human body.

It is far from random that the classic Greek order that became an example for the whole West-European culture for nearly three thousand years completely reflects the human body regularity, its symmetry and asymmetric proportions [7, p. 12-13]. Or: the active use in the Baroque Italian constructions and sculptural works of marble of the 18th-19th centuries. Vatican and immortal masterpieces of J. L. Bernini, Reggia di Caserta near Napoli (the project of the architect Luiji Vanvitelli, middle of the 18th century) and other peculiar villas were of course not in the last by the availability in the richest deposits of this most beautiful and most valuable natural stones in Italy.

Walking along boulevards and avenues of Paris or staying in the century-long silence of Rouen Cathedral, Cathedrals of Reims or Stuttgart, Amiens or Notre Dame de Paris watching from under the shadow of park trees the Chaverty Castle, or Amboise, Vaux-Le-Vicomte or Fonteinbleau, here, there and everywhere the eye glides over the practically monochrome grey and sand color shades of walls’ surface, facades volumes, the amazing beauty of cut shapes. And this is also not surprising and finds its direct expression in the universally spread sandstone at the territory of the former Roman empire. This natural construction material lends itself to machining, cutting, texture faceting much easier than many other stones. Alongside with this it is amazingly strong. The gravers and sculptors managed in sandstone, for instance show not only faces of Evangelic recorders heroes on the walls of the Reims Cathedral, but underline their special meticulous and sarcastic glance hinting (particularly hinting) at the revealed exegesis knowledge, disarm any lofty human concealment and the dark and earth empirical psychology. In time the sandstone gets darker but this only stresses the special metaphysics of buildings and temple proportions accumulating senses of time.

The top of the whole classic is the western-European culture that became possible inheritance of the human culture and the Spirit itself thanks to the Baroque architectural shape development in particular. The famous Mirror Gallery in the suburb of Paris for the period of its creation (1676-1684) expressed not only the highest metaphysics and the absolute subjectivity symbolization as well as the economic power of France, industry development. Mirrors production at that time required specific knowledge in the sphere of chemistry, thermo-physics and materials treatment, skills and developed expensive technologies.

The striving to underline the internal orthodox union believers and the Emperor autocratic power found probably the best expression in such natural material as granite, which was mined near St. Petersburg at the shores of Karelian and Finnish lakes and which the colonnades of St. Isaac’s Cathedral, Embassy of the Winter Palace were created (after the fire of 1837 the columns of the
artificial pink marble were replaced by the monumental columns cut of Serdobol grey granite) and such important architectural memorial, the dominant of the entire center of St. Petersburg as the famous Alexander column. The column on the Palace, as well as many other constructions and decorations of facades and interiors creating the northern imperial capital appearance. We also recall here another such peculiar example: after the fire of 1837 in the Winter Palace total reconstruction works were carried out. The greatest fire left behind it only a single black framework of the remnants of Emperor’s residence. In the actual restoration cause a new George throne hall of the Palace (created already during the lifetime of Katherine the Great in 1795 by the architect J. Kvarengi) for the first time in such huge architectural objects metallic frames were used to create the fixtures and covering of the roof instead of wood and stone arch under architect V. P. Stasov’s decision. These metallic constructions were created at the Alexandrovsky work by M. E. Clark. Above those the Winter Palace is basically a brick-work construction and not a stone one, and for its completion larger volumes of special technical and technological methods are required. These examples could be continued now as well.

Summary
Looking at the past and tragic 20th century we see the analogy. The domination of steel and concrete, metal and synthetic materials is explained by the production development, relied on the science-based engineering elaboration. K. Siegel gives the following description of the 20th century architecture: “Modern frame constructions appeared as a result of steel and concrete in the construction practices. The common frame constructions features are the decrease in the bearing elements cross section elements size until the minimal according to the static calculations and precise functioning limitation of bearing and non-bearing elements. A frame consists of crossbars and racks rigidly connected with each other. Advantages of its usage are mostly revealed in a multi-storey construction. The larger bearing capacity of new construction materials allows to erect the higher constructions in accordance with increasing modern requirements. Basically, frame buildings of steel and concrete are specific for the modern cities appearance as well as half-timbered structures were used for medieval cities” [4, p. 13]. Thus, the form, function and material correlation in the modern architecture acts now as well as in the past as one of the architectural products integral shape (image) creation basic factors. And that is why the space structures conceptual measuring self-definition problem still remains actual in architecture improvement technological and material basis conditions.

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