

JOLANTA OWERCZUK\*

## ARCHITECTURE „IN LINES”

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### ARCHITEKTURA „W LINIE”

#### Abstract

A line is an integral element accompanying architecture. It is the first line in a project idea record. A line can describe the form of a building, it can also be its main mean of expression. We perceive architecture by lines. A line as art in situ enriches the architectural space due to the perspective it plays with the viewer and the substance.

*Keywords: line, perception of architecture, linear architecture, anamorphoses*

#### Streszczenie

Linia to nieodłączny element towarzyszący architekturze. To pierwsza kreska w zapisie idei projektowej. Linią opisać można formę budowli, może też ona być jej główny środkiem wyrazu. Poprzez linie postrzegamy architekturę. Linia jako sztuka in situ wzbogaca przestrzeń architektoniczną, dzięki perspektywie gra z widzem i materią.

*Słowa kluczowe: linia, postrzeganie architektury, architektura linearna, anamorfozy*

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\* Ph.D. Arch. Jolanta Owerczuk, Engineering Design Studio, Department of Housing Architecture, Faculty of Architecture, Białystok University of Technology.

*You play the green? I do.  
You've got green? I have!*

According to the teachings of Euclidean geometry only three dimensions suffice to describe the shape of any form and determine the relative positions of masses. A point, a straight line and a plane are in the classical approach the basic elements, the fundamental concepts. All other shapes can be expressed using these concepts. Lines, planes and solids, as noted by Bohdan Lachert, reflecting edges, surfaces and volumes, are the elements of architectural plastic. Compiled by the creator's vision one-, two- and three-dimensional elements of space define both the structure, the outer shell of the work, and the shape of its interior [4, p. 23]. According to the Dutch architect Cornelis van Eesteren, associated with the De Stijl group, by abstracting the tensions and functions of the construction elements and treating the sub-string as a line and a wall as a platform, the architect creates the architectural space „from the general space – from the chaos” [4, p. 23].

While playing the green game, it is necessary to have something in this colour always with you in order to stay in the game. Thinking about architecture as a kind of a game, it may seem that a line is an always accompanying, necessary element of the game. You play architecture? I do. You've got a line? I have. The line, as a term in the context of architecture, appears in different situations and can have many meanings. The first thought most commonly combines it with a drawing, a sketch – a record of ideas, the technical development of a project, or a memo or a drawing from nature. A solid shape, topography is sometimes called a line. Understood in this it way becomes an element of the perceived view. It can also be understood as the shape of a building or land. There are works in which the composition of lines makes the main mean of expression. The line is also art accompanying the architecture. Once it included wall paintings, painted ceilings and polychromes. Today street art is popular.

A line, although from the point of view of geometry is devoid of width or depth and is length only, is an important element to form any visual construction. Wassily Kandinski indicating the role of a line in sculptural and architectural compositions highlights the fact that any expanding of the form means „expanding the linear form”. He refers to the Eiffel Tower as an example of the first and most important attempt to construct a particularly high building of lines only. In this case, as he adds *the line eliminated the plane* [3, p. 110].

The words of Paul Cézanne also focus our attention on the importance of elementary forms in reading space. The painter wrote to Emile Bernard:... *look at nature through cubes, spheres and cylinders, everything in proper perspective* [7, p. 126]. Furthermore, these words indicate that we will perceive a line in the spatial compositions in accordance with the laws of perspective. Thus, its impact will depend not only on the shape of the line, but also on its orientation in space and the position from which it will be seen.

It should also be mentioned that apart from the edge lines defining the shape of the mass, planes and lines forming decorative motives on facades and floors, there are those which are not given a physical form. These are axes, the lines connected with the structure of the form, binding its parts, defining the proportion of divisions.

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<sup>1</sup> A fragment of a dialogue accompanying the once popular play “The green game”.

## 1. The play of lines as an element of the perceived form

Seeing requires from the viewer a certain activity – it is not enough to be passive, to wait until the image is shaped on the retina of the eye. The retina can be compared to a cinema screen on which a variable sequences of images are constantly shown, but the controlling brain consciously records only a few. On the other hand, only a vague visual impression or even a little detail is needed to recognize that one knows whether this or that thing was seen [8, p. 35]

As noted by Juliusz Żórawski, while watching the eyesight moves from point to point. Wandering along straight lines, it takes the shortest possible path between them. [14, p. 25] These lines form a grid of straight lines. Any such grid is based on a galaxy of points freely chosen by the viewer. By this arbitrarily chosen galaxy of points we see all the scenery. When attempting to recall a view from memory, the galaxy of points is simultaneously recalled which was most obvious at the time of this experience. *Everything that surrounds us always and everywhere we reconstruct in thoughts on the basis of experience built by correspondence points most variously related to each other* [14, p. 75]. Architecture is all the more understandable, clear to a wider audience, the more it includes general, common cognitive elements. This allows us to communicate through the simplest of verbal or pictorial messages [14, p. 20].

The form „drafting” lines are different in direction and shape and give the perceived buildings more or less dynamic character, accentuate the shape, keep an eye, and sometimes they cheat.

The least complicated in visual terms is a straight line. As an invention of the human sense of sight it is characteristic of the shapes that man creates [1, p. 326]. Straight lines make it easier to understand the whole architectural composition, and enhance the interaction between its different parts [13, p. 92].

We can assume that the simplest of all directions of a line are vertical and horizontal directions. Our whole concept of space is based on the vertical-horizontal reference system. Wassily Kandinski, for whom the lines are characterized by a tension-dependent direction, determines the horizontal line as passive and cold [3, p. 57]. We sense it as calm and steady because the individual is most accustomed to the long line of the horizon [11, p. 14].

Different in nature and expression is the arc, as opposed to a straight line devoid of width and depth, it *has the germ of a plane hidden in it*. With its curvature it defines a fragment of the plane. In addition, tracing a straight line differs from the time course of tracing the curve. The more mobile a curve is, the longer time it takes [3, p. 85].

Shortening the distance in frames of the perceived space depending on the place of observation makes the curve of the road, the contour of the curved wall seen once as a gentle curve, but sometimes more rapidly twisting than in reality. With the change of scene the dynamics of the curve line image changes.

## 2. Linear form

Among the architectural realizations of recent decades, examples of forms constructed from lines can be found (the Eiffel Tower mentioned above) and buildings of a linear form.

At the end of 2009 the National Museum of Art and Architecture in Rome designed by Zaha Hadid was opened to the public. The project was developed at the end of the 1990s. *The building, which Hadid proposed, was like a giant knot of snakes* [12].

After the announcement of the competition results, the project was presented several times in magazines. The illustrations presented conceptual sketches and photos of the model, in which the mass of the museum could be seen primarily in plan view. The expressive form was read as a composition of curved lines. Horizontal parts of the building, corresponding to levels, writhed in space giving the impression of climbing on each other like *a flyover on a highway* [5]. The view of the museum fixed in the memory was confronted, two years ago, with the building realized in reality. The mass appearing before the eyes, while close to it, does not look like the picture coded years ago. On the ground level the high concrete walls can be seen, slightly waved, overlapping and cut by fragments of glazing. The logic of the composition can be discovered inside the building. The ceilings, lighting and stairs wave and intermingle in a way that recalls the shapes known years ago.

Completely opposite to the curved lines intertwined in space of MAXXI is the aesthetics of Agora's headquarters building at Czerska Street in Warsaw. The building was constructed in 2002 on the basis of the JEMS Architects team project. The main mass is in the shape of a cuboid with a horizontal layout. As in the previous example, the building is perpendicular to the frontage of the road. The main element determining the expression of Agora's architecture is the multi-layered front facade. The attention of people going along Czerska Street focuses on a fragment of the wall visible in the perspective of this street and it directs their eyes deep into the lot. Agora is, as the building is defined by one of the authors, an architecture of „meshes and textures” [10, p. 27]. The horizontal arrangement of the building is emphasized by the horizontal steel beams that divide the elevations into horizontal stripes corresponding to the five floors. On the facades visible from the street, in a perspective cut, they create a drawing of converging lines and lead the passer-by's sight along the facade to the entrance situated within and into the property. The wide cedar planks, perpendicular to the face of the wall, form, together with the steel beams, an orthogonal grid. Their place seen in the perspective cut concentrates as we move away; the planks, „overlapping” each other form the „full” strips. Meandering behind this sun protection curtain the external, proper glass wall is „hidden” from the views from the street and the building gains a closed character that emphasizes privacy.

To those staying on the premises the building appears in a frontal view, which because of the proportions of the square (long and narrow) covers a part of the facade. This view, „opens” before the viewer the full depth not only of the facade's „flesh”, but also the „transparent” interior. The building's location and the resulting play of views, showing the building in such diverse scenes, helped to create a dynamic image despite its laconic mass. The composition of the Agora's facade, built exclusively of straight lines in orthogonal divisions and levels, thanks to the perspective, gained a particular image in the perceived pictures.

### 3. A grid of straight lines

A grid of straight, conventional lines, leading the eyes when perceiving the form, which was discussed above, „materializes” in the Pavilion 2002 designed for the Serpentine Gallery in London by Toyo Ito. The walls and roof of this rectangular, single-storey block with a square plan have the form of a steel and glass raster composed of intersecting lines and geometric shapes of sharp angles, often connected only at the vertices. The corner edges of the pavilion get lost in the variety of directions and relaxed composition of the straight lines. The presence of a corner is revealed only by beams placed within the outline of the building at its base, defining, seen from

the side, right angled arms. These are the only clearly defined edge lines. This play of lines gave the lapidary rectangular block a dynamic character. A similar composition, resulting from the same construction scheme as the one adopted in the pavilion in Hyde Park, was proposed by Toyo Ito for the Tod's building in Tokyo. The concrete raster of the exterior walls has a more organic form here, inspired by the trees along the street. The reinforced concrete facade is entirely covered with glass panes. Reflections on the glass, complementing the play of lines and shapes, make the weight and shape of the mass unreal, deepening the illegibility of the corner.

#### 4. Anamorfosis – the play of perspective

Based on the rules of perspective, defined in the Renaissance, the art of illusionistic decoration i.e. *trompe l'oeil* was developed. Images casting three-dimensional space in a very suggestive way were made not only on the plane. They were created on the surfaces of vaults and domes. Leonardo da Vinci illustrating in the *Treaty* his method for transferring the image of a man to the surface of the barrel vaults adds that: “the eye (...) is not to care about the planes or curvature of the walls, but about the items shown on its surface in various places of the fictional space” [9, p. 146]. The artists creating the illusion of the real world on the surfaces of cylinders and spheres have used the phenomenon of anamorphosis, intentional distortion of the picture, which disappears when you look at it at the right angle. The most famous use of anamorphosis in painting is an elongated object at the feet of Ambassadors presented on the portrait by Hans Holbein (1533). Viewed at an angle of twenty-seven degrees it turns into a human skull – a symbol of death and transience.

A contemporary artist from Switzerland, living in Paris, Felice Varini uses the phenomenon of anamorphosis in his work. His „canvas” is the architectural space and its surroundings. He has raised play with perspective to the rank of art. Using a projector he creates geometric constructions, simple shapes, on the surfaces of the urban landscape and interiors – circles, polygons, compositions of straight lines that can be seen in the proper configuration from one point only. They exist only in the space in which they are placed, without it they have no *raison d'être*. They then seem suspended in the space, when in fact they are deformed shapes marked on the surfaces of walls, ceilings, floors and other elements. Viewed from another angle they become incoherent tangle of lines and fields [2]. When the observer again approaches the viewpoint, the individual fragments begin to lay out in a clear whole.

One of the older works of Varini is an ultramarine square created on the concrete structural elements inside the School of Architecture in Nancy. The lines that seem to be haphazardly scattered, at one point in the hall on the second floor make a distinctive shape, which has become almost an emblem of the school. From April to August 2015 in the La Villette Park pavilions four recent works by the artist can be seen.

Each piece of work by Felice Varini is a kind of a mere trifle with the viewer, a game of art and architecture, play with a line in the architectural reality.

Lines: passive horizontal, vertical active or the most dynamic of all the straights – bevels, and finally curved lines that changing in nature are a regular part of the play in architecture. They help to perceive the form, but sometimes they cause delusions that deceive the eye. The architectural form is sometimes subordinated to the line. And finally, in the artist's hands it becomes an instrument of flirtation with the art of architecture. They introduce additional values to the built-up space.

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