

ALEKSY ŁAPKO\*

FROM SKETCHES TO ARCHITECTURAL PROJECT.  
INSPIRATION BY NATURE AS THE GENESIS OF  
ARCHITECTURAL FORM BASED ON SELECTED  
BUILDINGS BY SANTIAGO CALATRAVA

OD SZKICU DO ZAPISU PRZESTRZENI.  
INSPIRACJA NATURĄ JAKO GENEZA  
FORMY ARCHITEKTONICZNEJ – NA PRZYKŁADZIE  
WYBRANYCH OBIEKTÓW SANTIAGO CALATRAVY

**Abstract**

The architectural object may arise as a result of inspiration from Nature. But firstly, the idea appears in the mind of the architect, which is then realized in the form of a drawing. The first concept sketches that support the idea of the project are the base of a project, and thus an architectural object. This paper briefly describes the design process based on selected buildings by S. Calatrava.

*Keywords: inspiration of nature, the design process, S. Calatrava*

**Streszczenie**

Dzieło architektoniczne może powstać w wyniku inspiracji Naturą. Lecz w pierwszej kolejności rodzi się idea w umyśle architekta, która następnie zostaje urzeczywistniona w postaci rysunku. Czy pierwsze szkice koncepcyjne mogą być nośnikami idei projektowej, na bazie której powstaje projekt, a następnie obiekt architektoniczny? W przypadku S. Calatravy, zabawy w rysowanie architektury można traktować całkiem poważnie.

*Słowa kluczowe: inspiracja naturą, proces projektowy, S. Calatrava*

\* M.Sc. Arch. Aleksy Łapko, The Department of Architecture of Local Cultures, Faculty of Architecture, Technical University of Białystok.

Inspiration from Nature has manifested itself in art since the beginning of human civilization. Actually, you could venture to say that the mapping of Nature was something peculiar and natural to human society from the first moments of its existence.

The manifestations of inspiration from Nature in art, especially in architecture, took on different forms and characters depending on the prevailing philosophical views, the current intellectual currents, the place that art occupied in society, as well as many other factors. Threads adapted from nature can be found both in architectural detail as well as in the proportion of the components of architectural objects, but also in the same architectural form. Without wishing to go into the issues concerning the relationship between architecture and nature, as that would require a far broader discussion, it is worth mentioning that this problem has been exhaustively analysed in the work of Andrzej Cząstka *Architecture and Nature. The problem of mimesis in architecture* [1, p. 64].

In touching on this topic, it seems reasonable to pay attention to how the inspiration of Nature can initiate the design process and analyse, even in summary form, the issue. In order to illustrate this, a few examples from the circle of contemporary architecture have been used, namely several buildings by the distinguished engineer and architect Santiago Calatrava.

The fascination of and inspiration from Nature is clearly used in the work of Calatrava. What is characteristic of his work is the expression manifested in the forms of architectural buildings that fully harmonize with the design, reveal its structure, and clearly present the work of construction. Calatrava's architectural objects can be compared to enormous sculptures. It is probably the sculptural form that makes the relationships between the architecture created by Calatrava and Nature so clear and recognizable.

In the case of Calatrava, this inspiration from Nature is also reflected in his sketches. Are these sketches a kind of archetype of an architectural object? You should think so. In this case, the architect's drawings, with apparently little in common with architecture, are important media of the idea of the project. An architectural landmark becomes the result of the fun of drawing.

Among Calatrava's many great works, 3 buildings have been chosen to discuss the topic.

- The planetarium in Camino de las Moreras in Valencia is a clear example of an architectural object inspired by Nature, in this case – the human body (as in the case of many other works by Calatrava) (Ill. 1). The architectural form of the building is associated with the human eye. The association is also justified by the moving steel structure which obscures and reveals the planetarium just like an enormous eyelid. An interesting yet fully understood solution used by the author is the use of reflection of the architectural form on the surface of the water, which makes the idea of the design very clear and the composition creates an unambiguous whole (Ill. 2. and Ill. 3.).
- The TGV station in Liège (Ill. 6) is a building that is distinguished by its lack of facades (traditionally understood), giving the impression of “transparency”. This approach has created an interaction between the inside of the station and the environment. The glazed steel decking allows both the perception by the recipient (underneath the overlap) surrounding the station, as well as allows people outside to observe the structure of the interior. The composition of the architectural form of the station manifests what is peculiar to many of Calatrava's works, namely the expression which can be seen in the structure of its main elements, designed as gently overlapping hatch lines that form the basic structural elements of the building. The large spans of the arches were justified by functional conditions, and at the same time

helped to create a free interior space not divided by supporting objects. After analysing the architectural form of the TGV train station, it seems to be reasonable to say that it was created under inspiration from Nature. Mild, penetrating arc lines – the main elements of the composition, which are also the basic elements of construction – may be associated with liquidity of motion, and the soft and gentle shapes of the human body (Ill.4 and Ill.5). Calatrava, in modest statements, explains to us, the recipients, his intentions in the design:

I imagined a building without facades with a soaring roof above offering protection from the elements (particularly the ever present rain of the Belgian Winter). This could maintain the views through and of the station. The vaulted shape was a natural development of this vision while the soft (perhaps feminine) undulating curve of the roof was selected to mimic the graceful rise and fall of the Cointe hills beyond. [4]

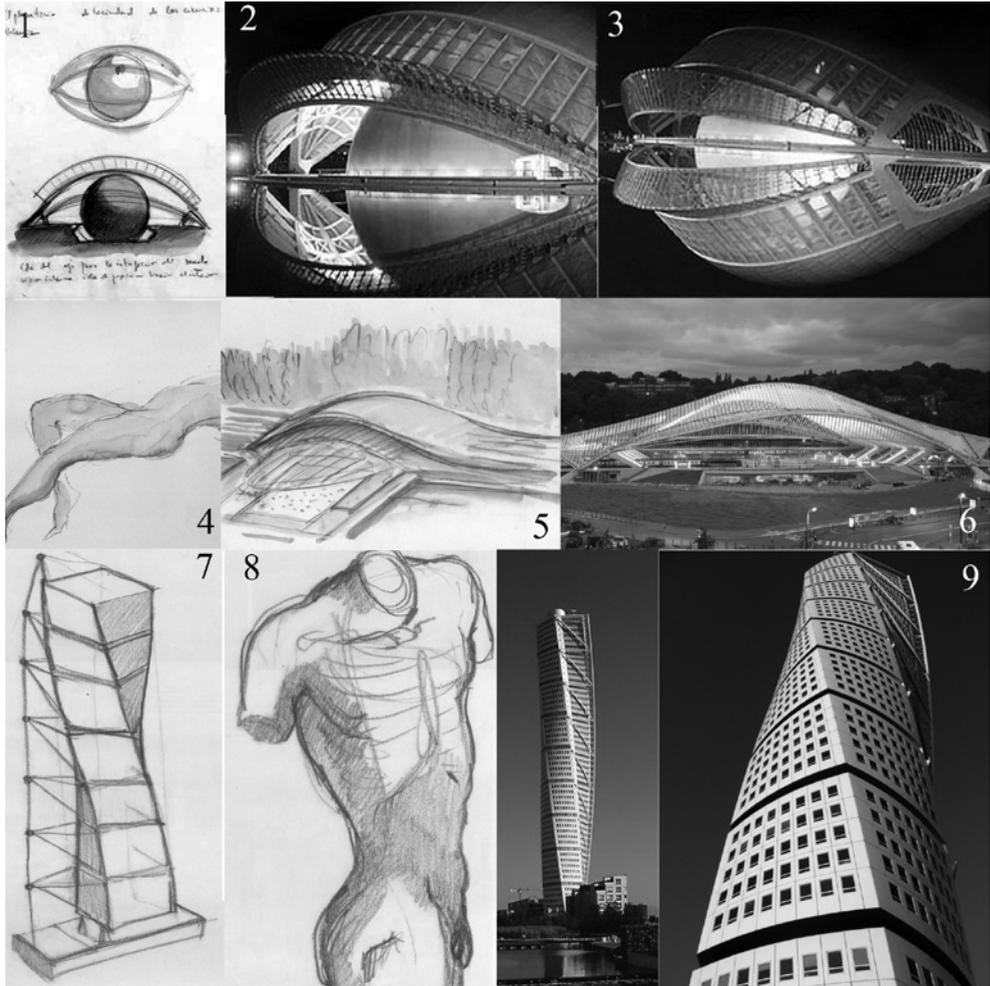
- Turning Torso in Malmö is a 54-storey residential building (Ill.9), the prototype of which was Calatrava's sculpture "Twisting Torso". The architectural form of the building was inspired by the movement of the human body (as indicated by its name), but the realized idea of the design is not as immediately clear and obvious as in the case of the planetarium in Valencia. The Turning Torso's architectural form has been created in such a way that, although it does not cause an immediate association with the human body, you can see the different components of the composition, which can be seen as a further or closer analogy to human body parts. One of these elements of composition (which also has a structural role) is an exterior steel vertical lattice. Comparing the building to the human body, such an element can be interpreted as the spine. The shape of this architectural form may evoke associations with a twisting human body (Ill.7 and Ill.8). This "twisting" of the building around its own axis causes the building to be perceived differently depending on where the observer stands. As in the case of observing the human body from various directions, the impression is that it spreads upward, or conversely, narrows (this effect is increased by light and shade).

The aforementioned architectural objects reveal Calatrava's inspiration from Nature (many other of his buildings also confirm this). At the same time, the examples, as well as concept sketches, allow us to magnify the process of creating the work.

The archetype which is inspired by a future architectonic item undergoes some creative transformation in the mind of its creator. This creates the first conceptual outline, which then becomes the basis for the process of creating the architectural form. At this point, it is worth quoting Andrzej Cząstka's monograph:

"The image as the source and prototype of concepts of architectural works [...] is a special kind of artistic creation, with infinite potential ability to construct an individual version of the real world, making it the "medium" between Nature and the world of imagination of the artist manifest in the shape of works" [1, p. 64].

Given this thought (which can be regarded as a claim), it is appropriate to refer to the previously mentioned examples of the works of Calatrava. In his case, the records of the thoughts presented in the form of sketches become the "prototype" final architectural form. Inspirations drawn from nature are preserved in the mind of the author and converted into



- III. 1. Conceptual sketches by S. Calatrava to design Planetarium Camino de las Moreras [5]
- III. 2, 3. Planetarium Camino de las Moreras [7]
- III. 4, 5. Conceptual sketches by S. Calatrava to design TGV station in Liège [3, p. 88,89]
- III. 6. TGV station in Liège [8]
- III. 7, 8. Conceptual sketches by S. Calatrava to design Turning Torso in Malmö [3, p. 392]
- III. 9. Turning Torso in Malmö [9]

images. These images then receive real shapes defined by the artist in the form of a two-dimensional sketch or in three-dimensional form, e.g. a sculpture.

In a sense, such two-dimensional or three-dimensional records can be treated as a specific game (seemingly frivolous). However, this game is nothing more than a record of the architectural space. If we look at architecture in the broad context, not only in the context of a specific, formed and composed space, it becomes a medium for an idea, thought or symbol.

## References

- [1] Cząstka A., *Architektura a Natura. Problem Mimesis w architekturze*, Kraków 2007.
- [2] Flaga K., Januskiewicz K., Hrabiec A., Cichy-Pazder E., *Estetyka konstrukcji mostowych*, Kraków 2005.
- [3] Jodidio Ph., *Santiago Calatrava*, Taschen, 2003, p. 88, 89.
- [4] <http://www.arcspace.com/features/santiago-calatrava/liege-guillemins-tgv-station/>
- [5] [http://www.domosfera.pl/blogi/talamala/2012/05/inspirowane\\_ludzkim\\_cialem/1](http://www.domosfera.pl/blogi/talamala/2012/05/inspirowane_ludzkim_cialem/1)
- [6] <http://www.jmhdezhdez.com/2011/03/libro-book-turning-torso-calatrava.html>
- [7] [http://www.projectclassica.ru/v\\_o/11\\_2004/11\\_2004\\_v\\_02c.htm](http://www.projectclassica.ru/v_o/11_2004/11_2004_v_02c.htm)
- [8] <http://picasaweb.google.com/lh/photo/8ynvS3h39G399ed5Pz8Rww>
- [9] [http://s133.photobucket.com/user/baratkyy/media/450px-The\\_Turning\\_Torso\\_Malmo.jpg.html](http://s133.photobucket.com/user/baratkyy/media/450px-The_Turning_Torso_Malmo.jpg.html)

