

NATURAL ELEMENTS AS INSTRUMENTS IN INDUSTRIAL BUILDING CONVERSION

ELEMENTELE NATURALE CA INSTRUMENTE ÎN CONVERSIA CLĂDIRILOR INDUSTRIALE

ANDREI R.¹

e-mail: radu_and3@yahoo.com

Abstract. *The continuous growth of technology and the process of migration of industries left behind a vast built environment consisting of unused production spaces. For cultural, affective, ecological or economic reasons, many of these buildings are subject to architectural conversion towards civil functions. Architects must face the challenge of interpreting these highly utilitarian objects and adapting them to the needs and aspirations of the new users. Through their intrinsic value and their psychological effects, natural elements used in conversion increase the diversity and the quality of architectural composition and enrich the aesthetics of architectural space. Our paper analyses the expressive and informational potential of the natural component, emphasizing its formal and psycho-emotional effects*

Key words: *industrial architecture, architectural conversion, aesthetics, psycho-emotional effects.*

Rezumat. *Evoluția continuă a tehnologiei, însoțită de fenomenul migrației industriilor, a lăsat în urmă o uriașă masă construită de spații de producție neutilizate. Din motive culturale, afective, ecologice sau economice, din ce în ce mai frecvent acestea fac obiectul conversiei arhitecturale la funcțiuni civile. Provocarea la care este supus arhitectul constă în interpretarea unor obiecte concepute pe principii preponderent pragmatice și adaptarea lor la cerințele și aspirațiile noului utilizator. Prin valoarea intrinsecă și prin efectele psihologice, elementele naturale utilizate în conversia industrială cresc diversitatea și calitatea compoziției arhitecturale și potențează estetica spațiului arhitectural. Lucrarea analizează potențialul expresiv și informativ al componentei naturale, subliniind efectele sale formale și psiho-emoționale*

Cuvinte cheie: *arhitectură industrială, conversie arhitecturală, estetică, efecte psiho-emoționale.*

INTRODUCTION

More than two centuries of industrialization, marked by rapid technical progress, resulted in the moral depreciation of production halls, leaving behind a considerable built heritage, often damaged or deserted.

The experience gathered so far in the field of architectural conversion shows that industrial buildings and equipment raise a special interest due to the unusual forms, proportions and scale of these volumes and spaces, formerly inaccessible to the public.

¹"Gh. Asachi" Technical University of Iasi, Romania

The initial shape, based on practical principles, was designed to strike an efficient balance between profit and cost, and was therefore organised in modular form, convenient both in terms of prefabrication and for the possibility of later extensions.

As a downside, the composition obtained by repeating several identical modules often generates monotonous rhythms which may have negative effects on the human psyche.

While the building exterior often illustrates the representative function of facade volumes, for the same economical reasons, the interior is most of the times simple, using modest materials and finishing.

From the point of view of the relationship with the exterior, most production spaces use an introvert composition, a rather inadequate solution for the civil functions which usually require an open space and a continuous communication with the exterior, be that functional or visual.

MATERIAL AND METHOD

This paper analyses examples of architectural conversion of industrial buildings which use natural elements – vegetation, water, air – as a composition tool.

The selected cases cover the basic spatial types of industrial architecture (both single floor and multi-storey), considering both the interior and the exterior of the buildings.

In the final synthesis, we highlight the complex qualities of landscape compositions and their positive effects on aesthetic and psycho-emotional level.

RESULTS AND DISCUSSIONS

The use of natural elements in the industrial architecture conversion

In industrial architecture conversion, natural elements are often the ones which suggest the most suitable solutions in reconsidering the relationship between interior and exterior space, in a new family of shapes, formal or chromatic dynamics resulted from the changing of the seasons. Thus, natural elements can increase the architectural quality of the industrial building, either in terms of landscape design, combined with formal operations of opening the industrial space, or by including natural elements in the interior space, both cases establishing continuity between the interior and exterior (Andrei, 2012).

The Paganini Auditorium in Parma, former a sugar factory, remarkably accomplishes this continuity by removing the brick facades on the short side of the hall. This operation has a double effect, that of diminishing the presence of the building in the site and that of opening the concert hall's space and integrating it in the park outside it. The naturally dynamic landscape becomes the stage background, highlighted by the illumination system. (Fig. 1, Fig. 2) The contrast between the natural element and the building is, on a formal level, given by the juxtaposition of the cartesian network of window frames placed in the heavy full walls and the free, lace-like shape of the trees.



Fig. 1 - Paganini Auditorium (initially a sugar factory), Parma – exterior view



Fig. 2 - Niccolò Paganini Auditorium interior view

Another type of attitude was adopted in the conversion of the former Fiat car factory in Torino. Built between 1916-1923 and designed by architect Matté Trucco, it represents an important landmark for the town citizens. While in use, the number of employees reached the impressive number of 12,000. Apart from its emotional importance for the community, it is internationally famous for its architectural value, confirmed by the positive feedback of modern architects and adepts of the futuristic trend who considered it a key moment for the avant-garde of the period.

The green areas in the patios and inside the building contribute to the compositional unity through colour and formal register (Fig. 3). Thus, the orderly form of the facade is repeated in the layout of the natural elements.



Fig. 3 - Exterior view



Fig. 4 - Opening the space towards the patios

Extending landscape design into the interior space, beyond the perimeter structure of certain parts of the building's envelope, led to the creation of intermediary spaces which increase the permeability of the building towards the public space and the landscape design of the patios (Fig. 4). These operations reduce the introvert aspect of the building and create a new scale hierarchy, emphasising the structural elements and the integrity of volumes.

The conversion of industrial warehouses in Los Angeles in a community centre ended in a regeneration of the whole area by changing spaces of negative connotation for the population into an ensemble which created a new community pole.



Fig. 5 - Warehouses after conversion



Fig. 6 - Image from the patio of the ensemble

In the new design, the exterior space becomes the element that brings together the volumes otherwise treated differently in aesthetic expression. The design of the patio, specific to the region, uses the same trees types as the ones in the nearby streets, creating a formal continuity between public and private areas. Linear green registers add a human touch to the industrial image of the ensemble and come in harmony with the other interfering volumes due to their prolonged shape (Fig. 5, Fig. 6 **Error! Reference source not found.**). The textile elements used in the patio for solar protection are disposed so as to form a texture which is projected to the other parts of the complex in the transparent drawing of shadows. The result is similar to that of a modern art installation which uses air currents to create a dynamic effect.

The chromatic register used for the facade panels is in harmony with that of the green compositions, a detail which confers unity to the whole work.

Creative art meanings and effects of the landscape design works

Creative art values

The water mirrors created in the interior or exterior produce the effect of a game of images which overlap the fixed image of the building, in the form of vibrating reflexions (Fig. 8). Inside, the water mirrors bring more light to the space but also complexity and dynamics (Fig. 7).



Fig. 7 - Jigsaw Studio (initially a warehouse), Los Angeles



Fig. 8 - Stone Museum (initially warehouses), Nasu, Japonia

Vegetation used inside as well as outside, plays an ambience role in the conversion of industrial architecture. With their free shapes, green elements are in contrast with the rigorous geometry of industrial architecture, the landscape

design clearly contributing to the aesthetic quality and bringing a human touch to the converted ensemble (Andrei R., 2012).

Environment integration. Creating a bond with the exterior

One of the characteristics which define the relationship between the former production halls to the exterior is the introvert character imposed by the specific conditions of the production process. When the industrial building changes its function, especially when turned into public space, its introvert character can clash with the requirements of the new functional program. The bond with the exterior can be created either by integrating natural elements into the industrial space, or by formal operations on the building which could give a functional or visual continuity with the exterior space. The landscape design works undertaken inside the industrial buildings to be converted help create a direct connection between the closed space and natural sequences, following the idea of reconciling architecture with the environment (Fig. 9).

Another solution is creating planted facades which revitalize the image of the industrial buildings and at the same time suggest a spontaneous reintegration into nature (Fig. 10).



Fig. 9 - Conversion of industrial halls into office space, Koln, BRS Architecture



Fig. 10 - Caixa Forum, Madrid, arch. Herzog & de Meuron

The time component can be expressed in conversion by preserving the aspect of ruin and decay or by using plants to create the image of a deserted place (Fig. 11, Fig. 12). This method, used in romantic style gardens to express the irreversible passing of time, in a time when sustainability is in focus, also suggests an image of nature regaining a lost territory, restoring a natural order that had been destroyed (Andrei R., 2012).



Fig. 11 - Dwelling, (initially a cement factory), Barcelona



Fig. 12 - The Paradise Lost in Time (initially a paper factory), Taipei

CONCLUSIONS

Due to their intrinsic values as well as to the potential psychological effects, natural elements used in conversion increase the diversity and the quality of the architectural work and highlight the poetic feature of architectural space. Bringing a human touch into the industrial architecture can be accomplished in the process of adapting to the requirements of the individual or to those of the community in reference to a common code of values. Natural elements are the potential bond between parts, and the mechanism of emotionally and aesthetically appreciating nature is rooted into the archetype of our being. Through the creative qualities they enhance, through the new meanings they bring, as well as through the positive influence they have on the human spirit and psyche, natural elements can be a key instrument in the architectural conversion of industrial architecture.

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