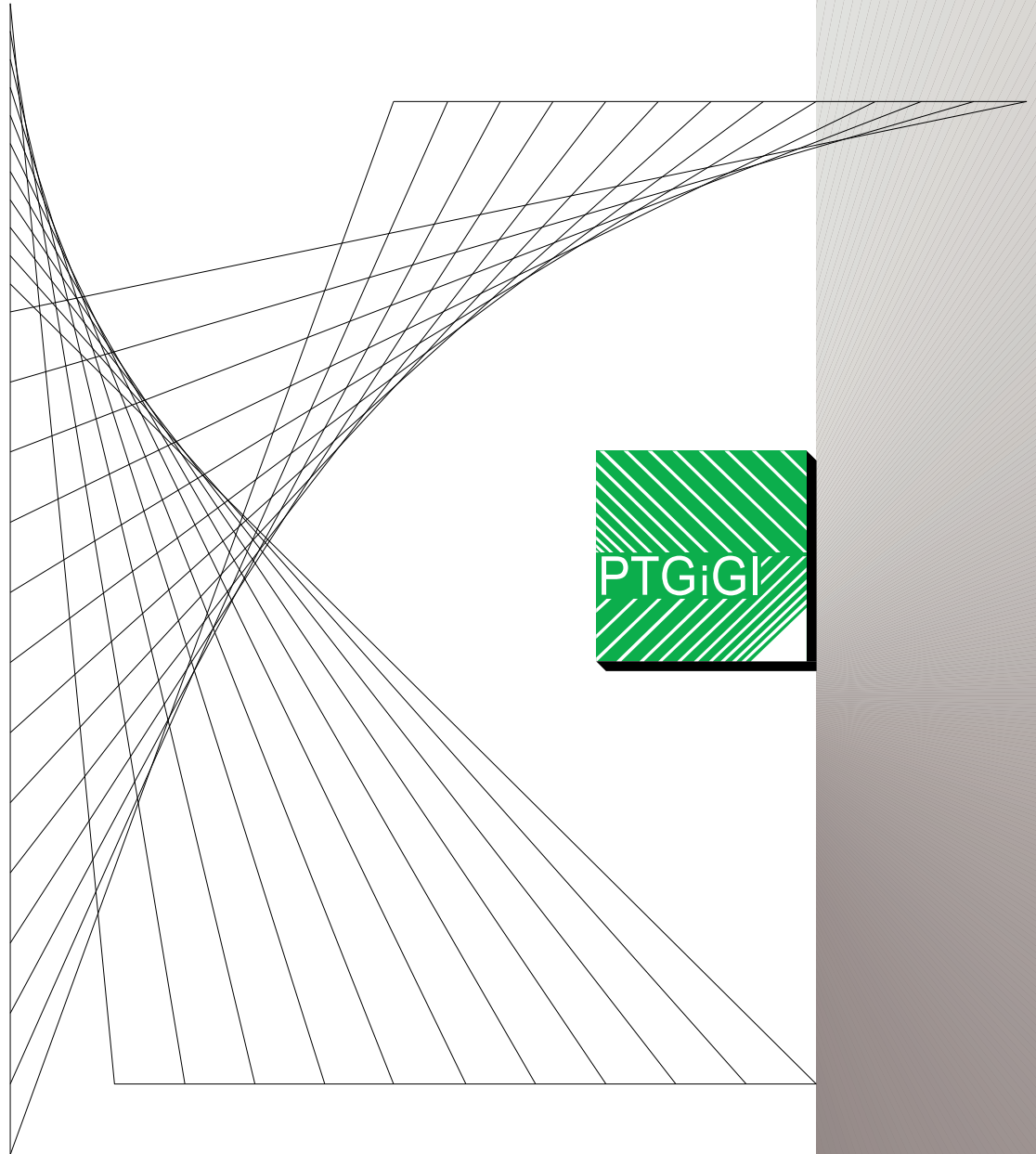


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THE PHENOMENON OF ARCHITECTURAL PANORAMA OVER THE CENTURIES

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Abstract. In the paper there is an analysis conducted of the basic both geometrical and artistic aspects influencing the originality of panorama phenomenon. The considerations are concentrated on the panoramic images of the architectural objects, which were an entirely innovative approach to presentation of the architectural space. The author emphasizes that the idea of the panorama painting didn't disappear with the appearance of high technologies imitating and mapping reality. In our times panoramic images are also being developed as reconstruction of Barker's panoramas in the original format as well as new presentations of various scale. The complement of the classical panoramas are panoramas in which the digital technology is used, mainly designed by Y. Asisi as well as virtual panoramas spread on the Internet. It is shown in the paper that every type of panoramas independently of its form is subordinated to the initial assumption of enabling the wide audience suggestive watching views under the condition of the proper localization of the observation spot. Each panorama in its structure has to conform to geometrical rules of mapping such kind of paintings. Getting to know these rules and a detailed mathematical description of them can be useful in the specific implementations of panorama images, treated as the contemporary works of art or as the forms of graphical mapping enriching design or promotional documentation of the architectural objects.

Keywords: panorama, cylindrical projection, wide angle perspective, illusion

1 Introduction

The history of panorama painting dates back to as many as over two hundred years. Panorama painting constituted a special international and cultural phenomenon and the type of an artistic work intended for a mass audience. As the beginning of panoramas one can consider the perspective hand-made pictures drawn on the oriental parchments or fourteenth-century sacred murals decorating churches and palace interiors.

A new look at panoramas was proposed by Stefan Oettermann in 1980. He states in his study "Die Geschichte eines Massenmediums" that the panorama is the type of the model forming visual experience that is such a kind of the artistic work which is ranked among shows [2]. Therefore, it should not be put at the same level as other any painting form.

However, the word "panorama" is formed from the Greek words: pan ("all") and horama ("view") and it means any wide-angle view or representation of a physical space. It turned up the first time as the definition of a new form for describing a full landscape on a single image. This technique was determined by Irish "portrait-painter" Robert Barker in 1787 and it was given a French title *La Nature a Coup d'Oeil* – Nature at a glance [6,7]. Barker's first semi-circular painting was *View of Edinburgh from Calton Hill*, exhibited in London in 1792 [7]. After the premiere of the second Barker's panorama: *View of London from Albion Mills* "the term, panorama" was used for the first time in London's *The Times* report. Since that time, panoramas and related forms of the visual presentations had a major

impact on the nineteenth-and twentieth-century entertainment in European and American cities.

2 The main assumption of the panoramic invention

The patent granted to R. Barker in 1789 specified his invention as "invention of an entire new contrivance or apparatus for the purpose of displaying Views of Nature at large, by Oil-painting, Fresco, Water-colours, Crayons or any other Mode of painting or drawing" [6].

This apparatus determined a proper arrangement of the whole, so a curved drawing or a painting with their station points for perfect an entire view of any architectural space or situation, as it appeared to an observer turning round.

The initial and fundamental intention of the panorama works of Barker and of his followers was presentation of the subject „*so close as possible*". The basic factors influencing the originality of panorama phenomenon are both geometrical and artistic ones. They are as follow:

- great precision and truth in presenting the issue,
- applying appropriate proportion,
- compiling with the rules of perspective,
- uniting proper painting and technical treatments for the purpose of creating so-called illusion complete.

3 Geometrical and technical aspects of panorama

From geometrical point of view the panoramic representation was a multicenter cylindrical perspective projection. The background of that projection was a curved surface of the canvas usually 15 meter height and 100 meter long, whereas the station points were located on the circular platform situated in the middle of the cylindrical surface.

The techniques of panorama painting differed from those applied in paintings viewed in more traditional way and they were regarded as very precise ones. It inspired the author to check geometrical aspects of the panoramic paintings, especially the geometrical correctness and accuracy of them. The results of geometrical testing of architectural panoramas available in the Internet in unrolled form were presented in [5]. They proved geometrical accuracy and precision of panoramas, which permits to state that the painters of panoramas used the principles of perspective in their art works. The correct usage of perspective was imperative, as the paintings were intended to be viewed from a distance and the lines sketched as curved had to be perceived as straight ones. The big precision of panorama paintings resulted from the great care in preparing panoramic drafts. In order to prepare sketches for the panorama, the panorama painters of landscapes used a glass cylinder large enough to put their heads and arms into it easily. Standing at the point of observation and looking through the glass cylinder they split their real view by outlining vertical lines on it. Then they painted the sketch of panorama on the paper wrapped on it. After unfolding, the paper determined a flat draft of the panorama. The transformation of this draft on a large canvas was made by the group of artists of various specializations under the supervision and with help of the author of the panorama. All work was performed in accordance with an artistic concept in order to maintain continuity and consistency of composition.

A lot of forgotten devices used by artists to capture accurate preliminary sketches were employed by panorama painters too. They were for example camera obscuras and lucidas, as well as panoramagraph. Due to the curved ruler added to the camera lucida it "made it possible to correct in advance the distortions in perspective that would occur when the sketches made on a flat surface were connected and bent into a cylinder"[2]. Also

“a bamboo pole about fifteen feet long” could be applied so that a painter was able to sketch from viewing platform.

The proved perspective precision which means geometrical correctness of panoramas as well as the truth in presenting the issue emphasize not only artistic but also documentary value of panoramas. Geometrical accuracy enables geometrical reconstruction and visualization of panoramic images [3,5].

4 The special effects and forms creating illusions

In case of the panorama representation, the effect of total immersion in the depicted scene was achieved not by skillful manipulation of perspective, but by manipulating viewer's imagination. That could be achieved by applying different devices and forms of presentation as follows (Fig.1):

- the cylindrical painting - cylindrical form of the canvas, surrounding the spectator from every side with colorful image, which could be admired in the full range of 360 degrees,
- the platform (belvedere) - the round shaped platform in the center of the room on the precisely calculated height and the distance from the linen, usually surrounded with a fence reducing the freedom of moving of the audience and making the observes view the painting from an appropriate distance,
- faux-terrain - a specially arranged ring between the platform and the canvas, continuation of the image shown in a picture with the stage and theater setting techniques employed there, (especially, so-called „attrapes“), in order to eliminate the border between their three-dimensionality and two-dimensionality of the canvas,
- velum - conical or umbrella shaped roof over the platform, effectively shielding both the light sources and the painting's top edge from the view point,
- lighting- natural, daily lighting via the rotunda's roof fitted with glass and deflected by linen screens with the aim of making shine from the picture by reflection,
- an initial corridor - dimly lit, almost dark corridor leading to the platform and preparing the spectator for the proper, effective interpreting of the painting.

Above things caused overall disorientation. Panoramas were created with the intention of illusion and cutting off spectators from the outside world, as well as putting them in the center of the scene presented in the painting so they could not compare the image with reality.



Figure 1: Panorama in Prague

5 Panoramas as a mass-media phenomenon

In 19th century Barker's new technics of painting expended all over the Europe and America and the panoramic paintings circulated between main cities. No other art form or medium was so popular and had such a great influence on the people's perception of image as panorama did. Besides panorama can be regarded as the first mass-media phenomenon. At the time when film and television did not exist yet panorama gave the opportunities for the general public to experience geographical and historical trips.

Creating panoramas had also very big influence on development of specific rotunda architecture. In the heyday of panorama most of the rotundas were monumental buildings, usually decorated abundantly. The standard building norm was the height of 15 meters and the diameter of 40 meters [1]. At that period, there was a fashion for a term-rama. New forms like: diorama, georama, cosmorama started to exist and grow. Finally with development of cineorama panoramas gradually began to fade away and were superseded by cinema and photography.

6 Contemporary panorama

Some panoramas survived until 21st century and still are on public display. The overview of all remaining panoramas gives [6]. The idea of the panorama painting didn't disappear with the appearance of high technologies imitating and mapping reality. Nowadays, the main role in creating new panoramas comparable in scale to 19th century panoramas is playing the Luxun Academy of Fine Arts in Shenyang, China. A lot of panoramas on a smaller scale are being painted in Australia and USA [6,7].

Another trend in contemporary panoramas constitute panoramas which are made with application of latest digital technology. Very famous examples of such panoramas are panoramas created by Yadegar Assisi. His 36-meter-high photo panorama of the Himalayas in honor of the 50th anniversary of the first scaling of Mount Everest achieved a great success. Additional effects like sound, music and gas were also applied in his exhibition [7].

The fascination of a 360° panorama art form inspires artists around the world to adopt panorama technique and create contemporary art on that basis. As an example of such an art work can be given a 180° angle panorama of Berlin's Brandenburg Gate at the end of World War II. It is 28 × 5 meter installation with a strong sense of space and coincidence with surrounding architecture [7].

Nowadays, the panorama phenomenon is still vivid and developing. However, it is considered in the different context as the meaning of the term "panorama" is wider now.

It is often used to describe images with wide formats (with aspect ratios of 1 : 2 or 1 : 3). Digital panoramas created by means of the modern devices can be divided into two groups: wide-angle panoramas and wide-format panoramas. The wide-angle panoramas in contrast to wide-format panoramas own curvilinear appearance. The flexibility of modern, digital panorama creation processes enables the use of the same source material to construct both a wide-format and a wide-angle panoramas for display on a computer monitor. The same conventional camera with digital stitching technique can be used too.

7 Comparison of classical and contemporary panoramas

The most important characteristic of both classical and contemporary panoramas is the large field of view. The maximum horizontal viewing angle is 360 degrees, whereas the maximum vertical angle is less than 180 degrees. Besides every type of the panorama, independently of its form, is subordinated to the initial assumption of enabling the wide audience suggestive watching views under the condition of the proper localization of the observation spot.

8 Conclusions

The panorama phenomenon can be treat as an unique art form and the way of perceiving virtual reality. Panoramas were an entirely innovative approach to presentation of the architectural space by mixture of art and low-cost technology with the use of geometric principles. Although panoramic imaging is a very old concept it didn't disappear with the appearance of high technologies imitating and mapping reality. It is still vivid and developing. In the author's opinion it will find more and more application in different fields connected with architecture, art, robotics and advertisement.

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ZJAWISKO ARCHITEKTONICZNEJ PANORAMY NA PRZESTRZENI WIEKÓW

W artykule przeprowadza się analizę zarówno geometrycznych jak i artystycznych aspektów wpływających na oryginalność panoramowego zjawiska. Rozważania prezentowane w artykule, przede wszystkim są skoncentrowane na panoramicznych obrazach obiektów architektonicznych, które były całkowicie innowacyjnym podejściem do przedstawiania przestrzeni architektonicznej. Autorka podkreśla iż obecnie, w czasach dynamicznego rozwoju telewizji i wirtualnych form multimedialnych ponownie powraca się do oglądania panoram. Co więcej, idea malarstwa panoramowego nie znikła wraz z pojawieniem się nowoczesnych technik imitujących i odwzorowujących rzeczywistość. Współcześnie również powstają panoramiczne obrazy jako odtworzenie panoram Barkera w oryginalnym formacie, jak również nowe przedstawienia o różnej skali. Uzupełnienie klasycznych panoram stanowią panoramy, w których wykorzystuje się technologię cyfrową, głównie autorstwa Y. Asisi, jak również panoramy wirtualne rozpowszechnione w Internecie. Autorka pokazuje w artykule, że każdy rodzaj panoramy, niezależnie od jej formy, jest podporządkowany wyjściowemu założeniu: umożliwienia szerokiej widowni sugestywnego oglądania widoków pod warunkiem odpowiedniej lokalizacji miejsca obserwacji. Każda panorama, musi więc w swej strukturze podporządkowywać się prawidłom geometrycznym rządzącym zapisem tego rodzaju obrazów. Poznanie tych prawideł oraz szczegółowy ich opis matematyczny może okazać się przydatny w konkretnych realizacjach obrazów panoramowych, traktowanych jako współczesne dzieła sztuki, względnie jako formy zapisu graficznego wzbogacającego dokumentację projektową lub promocyjną obiektów architektonicznych.