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Cartography and landscape painting of the 17th and 18th centuries as iconographic sources

Kartografia i malarstwo pejzażowe XVII, XVIII wieku jako źródła ikonograficzne

Abstract

In the study of historical architecture, especially the one that was transformed or ruined, of key importance is iconography, i.e. views of and panoramas of cities or their parts or individual objects.

Keywords: iconographic sources, cartography, landscape painting, credibility of iconographic sources

Streszczenie

W badaniach nad architekturą historyczną, a w szczególności pozostającą w stanie mocno przekształconym lub zrujnowanym, kluczową rolę odgrywa ikonografia, czyli widoki i panoramy miast lub ich fragmentów bądź poszczególnych obiektów.

Słowa kluczowe: źródła ikonograficzne, kartografia, pejzaż, wiarygodność źródeł ikonograficznych

1. Development of European and Polish Landscape Painting

As far back as the Antiquity people were creating images of metropolises or their parts: units or individual works. However, these portrayals that were sometimes peculiar and representative of a specific artistic technique or a convention of depicting reality, are of lesser documentary value. Still, they do constitute an invaluable research materials for architectural historians.

Only in the 17th and 18th centuries brought the peak and great development of the landscape painting. This is when vedute became popular: paintings, drawings, and prints depicting panoramas and views of historic cities and buildings in them (Fig. 1) with almost photographic precision. The Dutch were precursors of this type of painting. As far back as the 17th century they introduced a perspective based on geometrical principles supported by simple optical devices such as camera obscura.

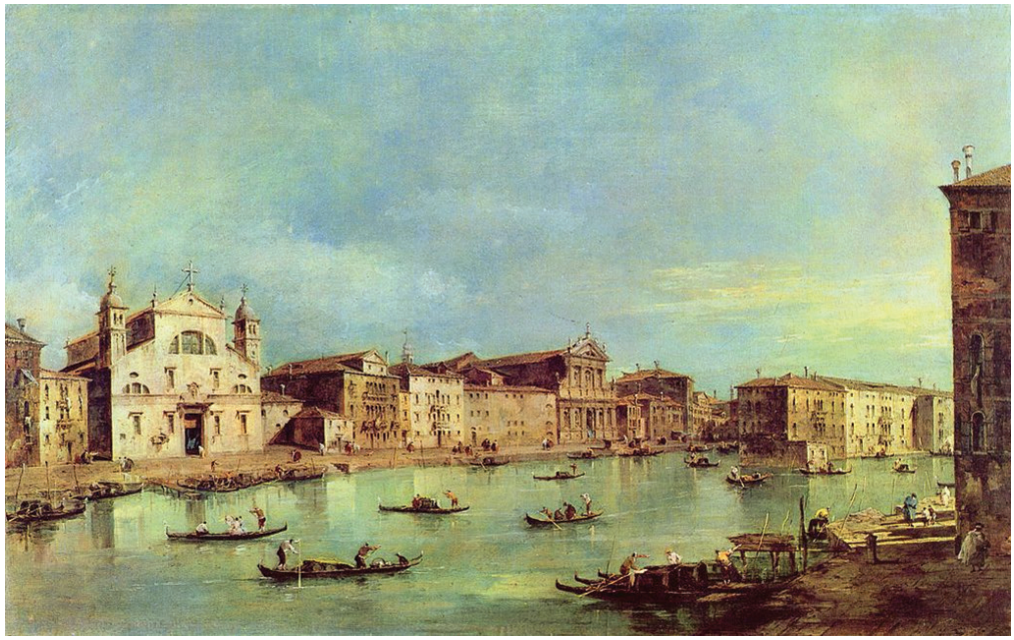

Fig. 1. Francesco Guardi – view of the Grand Canal in Venice, second half of the 17th century [6]

The fact that vedute started to flourish was closely connected with the rediscovery of the antiquity that begun with journeys of artists, architects, and archaeologists, and first studies conducted in the ancient Greece and Rome, as well as other cultures in northern Africa that were identified during the spectacular journey of Napoleon to Egypt in 1785.

European veduta painting was part of the education of young people in Great Britain adapted to other European countries and based on the Grand Tour program that enabled to learn about the world, its culture and history, broaden one's horizons, and exchange ideas and information.

In the 18th and 19th centuries, the veduta painting in Poland was developing on the one hand as part of and under the influence of European trends and on the other, due to heavily emphasized aspect of discovering and documenting great national past which was of a special importance after Poland lost independence and its statehood was eliminated by the partitioners (it became the carrier of patriotic content and the source of continuation of national consciousness and identity).

The last king of Poland, Stanislaw II Augustus, played an important part in this program. He established an artistic academy under his patronage, Academy of Fine Arts, and invited prominent artists (mostly Italians): a Venetian *vedutista* Bernardo Belotto (known also as Canaletto) and Marcello Bacciarelli whom he entrusted with the management of a smaller artistic school, the *Royal School of Painting*.

Most of the artists who trained there were portrait painters and miniaturists, e.g. Wincenty Fryderyk de Lesseur, Józef Kosiński, Józef Wall, and Zygmunt Vogel who was admitted to the Royal School of Painting when he was only 16. He was the one who was entrusted with the task of documenting ruined monuments of Małopolska (Fig. 2–4).

Polish veduta paintings:

Fig. 2. Ruins of castle in Janowiec by Zygmunt Vogel [10] Fig. 3. Ruins of castle in Krasnystaw by Zygmunt Vogel [10]

Fig. 4. Ruins of castle in Ojców by Zygmunt Vogel [10]

According to Jerzy Banach, value of these works lies in the attention to the accurate portrayal of the building's state using strokes that are "softer and kind to the age and state of the monument" [1, p. 131]. He explicitly states that apart from the documentation, the main goal of the project was to promote national memorials and monuments which "was justified by the general ideological trends: drawings of 'ancient monuments' and tombstones… are an expression of the passion for learning about the national past that was common then" [1, p. 131].

2. Credibility of the Iconographic Sources from the 17th to 19th Centuries

When assessing the credibility of drawings as iconographic sources, it is important to pay attention to not only the talent and artistic sensitivity of the author but also to the quality of their method and their knowledge of rules of depicting space. The craft required of them not only the knowledge of geometry and perspective but also of new methods that were developed most notably in the Renaissance, as described by Andrzej Białkiewicz. He mentions that as far back as the beginning of the 16th century "…the idea of the distance point was defined for the first time and the rules of drawing from the lateral perspective were given…" [3, p. 28]. Moreover, he comments on the role of tools that were used increasingly more and more often since the times of Leonardo da Vinci: "…he experimented with camera obscura that was improved with mirrors, prisms, and lens and in the 18th century became a popular portable box used practically to create perspective drawings…" [3, p. 36].

In his thorough research on the 19th-century iconography of Kraków, Jerzy Banach noticed an obvious evolution of the quality of panoramas both in terms of the technique and technology of print that was improving over time. He also mentioned that early drawings are characterized by a certain awkwardness and objects have "thick outlines and lose details in the monotonous greyness…" [3, p. 19]. With time and changes in the style, the content of the drawings started to diversify.

Furthermore, Jerzy Banach characterizes the documentary value of the examined iconography. He considers as most valuable the works of Henryk Walter, François Stroobant, and Jan Głowacki, attributing the accuracy of their lithographies to the desire for rivaling the competition of the photography as well as to the diligent documentary methods based on the system of drawing sketches from nature.

Based on the above-mentioned views, one can assume that panoramic views of cities from the turn of the 16th and 17th centuries are of vital significance as a historical sources recording information important for scientific reconstruction.

The opinion of Maciej Bonawentura Pawlicki [7, pp. 161–174] contributes a lot to the assessment of the iconographic materials for the purposes of scientific works. He established that even though in many analytical publications views of cities from the turn of the 17th and 18th centuries are considered to be "of licentia pictorica nature" illustrators creating panoramas of the cities included in the treaties knew the principles of geometrical structures

very well and were capable of reconstructing and illustrating the topography accurately using contemporary techniques of measurement and leveling.

When presenting this view, M. Pawlicki invokes "an important work by Guarino Guarini from the 2nd part of the 17th century that lists the principles of complex geometrical structures, projection of planes on spheres, and using principles of leveling to present complex topographical relief" [7, p. 164]. This author's research is based on the conviction that the most popular method of verification of credibility of panoramas of cities consists in the comparative analysis using later cartographic maps from the turn of the 18th and 19th centuries and comparing them with sources while only thorough and expensive field investigations may broaden knowledge about the spatial development and assess the real cognitive value of views from the turn of the 17th and 18th centuries.

Maciej Bonawentura Pawlicki compared in his article the views of the examined cities, Zamość (panorama printed in G. Braun's work from 1618), Warszawa, and Poznań, and their geometrical structures (using collineation[1]) with their actual layouts. This enabled him to reach an important conclusion concerning the cognitive value of the views which "were depicted using the established graphical norms and distorted according to the logic motivated by the principles of geometrical abstraction" [7, p. 173].

3. Geodesy and Cartography – Ancient Times and Antiquity

Geodesy (from the Ancient Greek word *geodaisia*: *ge* – Earth and *daiein* – to divide) began in the 3000–5000 BC as proven by the existence of surveying guidebooks in ancient Egypt and institutions that conducted surveys and created maps in China.

Geodesy and cartography were known and widely used in the ancient times when planning out and creating monumental layouts of palaces, temple grounds, cities, or even settlements for craftsmen building tombs and pyramids for pharaohs.

Without knowledge of principles of geodesy and cartography, it would be impossible to plan out, chart, and erect the greatest cities of the ancient world such as the Egyptian Memphis (with 30 thousand inhabitants in 3100 BC), Babylonian Ur (in 2030 BC it was the biggest city in the world with about 65 thousand inhabitants and the surface area of 50 hectares), or the capital city of Thebes (with 70 to 80 thousand inhabitants in the first half of the 3rd century BC). Plans of these ancient cities have regular, geometrical layouts of streets and squares as well as individual city blocks and prove that an accurate cadastral limitations were used.

Apart from geodesy, the methods of mapping terrain, natural topographic structures, and structures erected by humans were also being developed.

There is a spectacular evidence in support of this claim in the form of the oldest known map that was discovered in Iraq and carved into a clay tablet (Fig. 5, 6), originating in the Acadian city of Gasur. Dated to the period between the 24th and the 22nd centuries BC, it is

[1] Not of documentary value.

a garden plan. The map includes a layout of the adjacent mountains, rivers, and cities. Even the directions of the world are marked [8].

Fig. 5. original in a preserved state [8]

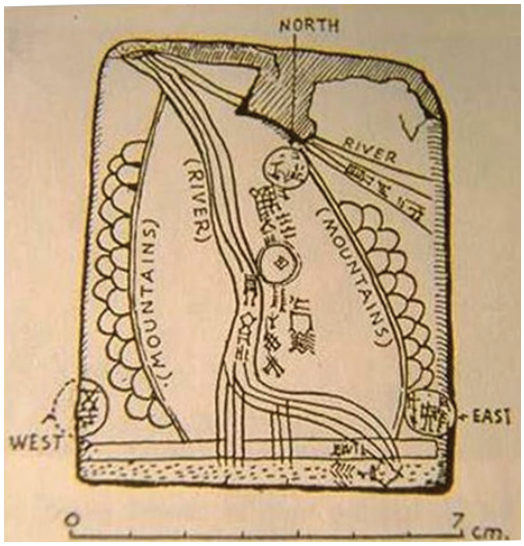

Fig. 6. graphic reconstruction of the drawing and its content [8]

A clay tablet from Gasur with the map of terrain and its topography:

The above-mentioned find leads to the question about the tools used during the surveying and creation of plans and maps based on the surveys from nature.

It turns out that the the so-called Mynas Codex of the National Library of France, i.e. a collection of various texts and treaties created by ancient copyists, confirms the existence of such tools.

The collection includes the description of diopter (Fig. 7), a surveying tool dated to the 3rd century BC. Thanks to the descriptions, the scientists were able to reconstruct it (Fig. 8).

The development of geodesy in Ancient Rome was connected not only with the urbanization but also with the administration and investments in the far-reaching areas of the Empire. It is a well-known fact that during the reign of Augustus, in the Empire there were professional corporations of surveyors as well as schools teaching applied geometry and law. Gromatici[2] or agrimensores used simple but efficient surveying tools, including the so-called Groma[3]. This instrument was used to map out the axes of main streets in Roman cities (cardo and decumano), roads, and aqueducts.

Historians of European urban planning are certain that in the early Middle Ages, in times of an extraordinary development of cities [2], of fundamental value were an excellent knowledge of topography and an ability to locate in in a planned composition and its parts.

[2] Association of surveyors in the times of Ancient Rome.

[3] A surveying tool consisting of a vertical tripod sinking in the ground and a bracket on which a rotary cross with arms at right angle was installed together with a device with a set of risers for setting horizontal position.

Fig. 7. A sheet with the description of the diopter [5]

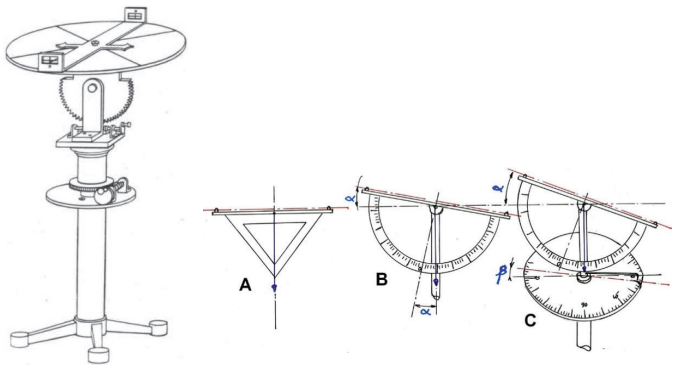

Fig. 8. The reconstructed model and evolution of the theodolite over time [9]

According to Tadeusz Tołwiński, "space surrounded with city walls was mapped out according to the estimated size of the city. Initially, medieval towns has several thousand of inhabitants. Later, this number increased to a dozen or so to several dozen of inhabitants... City walls were marked with certain reserve so that free space would remain behind the constructed residential blocks for some time that was used for farming or as market places" [12, p. 66]. He believes that the builders of such units had significant knowledge, abilities, and imagination.

Even if the Middle Ages had no spectacular discoveries and inventions, knowledge about city building was still extensive and based on the traditions of ancient architecture[4] [13, p. 112]. It is important that *The Ten Books on Architecture* by Vitruvius were discovered only in 1415 in the library of Saint Gall Abbey. Thus, one can assume that he might have been a well-known builder of cathedrals and knowledge included in his books had impact on the construction of such monuments as cathedrals in Chartres, Amiens, or Paris.

The development of cartography was a result of great geographical discoveries at the turn of the 15th and 16th centuries made by such people as Marco Polo, Christopher Columbus, and Vasco da Gama. They resulted in the introduction of such instruments as: *polimetrum* (for the measurement of vertical and horizontal angles), *theodolitus*[5], or an instrument constructed in the second part of the 16th century that was the closest to the modern theodolite (equipped with a compass and set on a tripod).

[4] The author believes that "very often the builders of cathedrals and churches had impact on the urban development of the entire city; contracts signed with the district reveal that they were often obligated to build defensive walls, fortified gateways, wells, and towers; thus, they were the true builders of the cities. Among them one can find the most outstanding architects of these times: Arnolfo di Cambio and Giotto in Florence, Maitani in Orvoieto, and others".

[5] A measuring instrument created by Jan Pieterszoon Dou (1573–1635) with two pairs of sight vanes set on a alidade.

Inventions connected with new printing methods (especially the development of typography, i.e. copying images and text in large quantities) supported the spread of cartography, especially in view of the needs created by the administrative management of one's own territories, development of international political and economic contacts, and an increasing social mobility.

The oldest system of copying images or pint multiple times was a technique of *estampage*[6] used in China. In the 8th and 9th centuries, the Chinese widely used woodblock printing that later spread in Europe in the 14th century. It was used to create not only illustrated books but also calendars and maps used more and more often in sailing and travels.

Wood engraving was gradually replaced with lead, tin, and copper plates. Since the first half of the 15th century, the copperplate (engraving on copper) had been used to create matrices of cities and maps of European countries or regions.

Lucyna Szaniawska writes about that when she analyzes the beginnings of European print cartography using woodcut and copperplate blocks [11, pp. 283–306]. Analyzing both the technique of execution and content included in the plans, she comes to a conclusion that the copperplate enabled to transfer more detailed geographical information, was more durable than woodcut and suitable for fast update of information. Furthermore, it enabled to increase the number of details in the drawing. Thus, cartographic works from the turn of the 16th and 17th centuries had high artistic quality invaluable informative value: "work of two craftsmen George Braun and Frans Hogenberg entitled Civitates orbis terrarum that was published in Cologne between 1572 and 1617 from the very first volume was full of plans and panoramas of cities that were rich in content and saturated with strokes" [11, p. 292].

However, not only the development of cartographic techniques and the improvement of geodetic tools caused the steady increase in the accuracy of geographic maps (their density and attention to detail) but also the requirements of new recipients, more and more often national authorities responsible for efficient administration and management of the given area [11, p. 292].

4. Geodesy and Cartography in Poland

In Poland of the Piasts, the need for efficient administration of the territories undergoing merger as well as for the development of urban settlement was the reason for creating royal "geodetic services". According to historians' research, this was the role of prince's and royal *zerdnicy*[7] who are mentioned in texts from the 12th and 13th centuries [4].

With time, *zerdnicy* would transform into royal chamberlains (position created at the end of the 13th century) and manage state treasury. This was the beginning of the territorial authorities appointed to decide in border disputes, estimate value of real estates, and

[6] Technique of copying images used in China during the reign of Tang dynasty that consisted in carving in stone or bronze and making impressions on paper.

[7] Polish word *zerdnik* is derived from the surveying activity done with simple tools: poles (in Polish: *zerdz*), sticks, and ropes. They measured land on site and demarcated city boundaries.

classify lands. At the end of the 14th century, chamberlains transformed into a self-governing institution of the gentry.

A significant agricultural reform[8] was implemented in the medieval Poland and a sudden increase in the settlement and planting of numerous towns led to the demand for qualified surveyors. Thus, in the 15th century the University of Kraków with the first Polish Geodesy Department started to train geodetic surveyors.

The beginnings of Polish cartography are connected with the dispute between the Order of Teutonic Knights and Poland and the need for documenting affiliation of lands to the Republic of Poland. Two maps from 1450 have been preserved: lands of the Teutonic Knights and lands of Pomorze Gdańskie. They were prepared for the presentation in the Holy See.

In 1491 plans of Central Europe were published in Poland by cardinal Mikolaj of Kuza and in 1507 Bernard Wapowski, astronomer and prominent Polish cartographer, worked with Marco Beneventano on the Roman edition of *Geographia Klaudiusza Ptolemeusza* atlas that included maps of Polonia, Lithuania, and Russia.

Contribution of another Pole, Wacław Grodecki, was recorded in 1570 in the form of preparation of the map of Poland for a famous European publishing house, a systematized collection of world maps, *Theatrum orbis terrarum*, prepared by Abraham Ortelius.

5. Conclusions

When analyzing cartographic works and landscape painting from the 17th and 18th centuries in the context of a dynamic development of the world, one cannot omit their important contribution to the scientific reconstruction of ruined, devastated, or significantly transformed units/complexes of buildings.

Progress in numerous fields of knowledge such as geodesy, mathematics, astronomy, and geometry and many geographical discoveries of these times and progress in navigation connected with them as well as the development of techniques of recording and copying images, translated directly into the quality of work of cartographers and artists who wanted to catch up with the rapidly changing world and specialized in their lines of work and thus, became documentarians in the context of their contemporary realities.

Thus, one cannot avoid an attempt at recreating a previous appearance of individual objects or even complexes without taking into consideration their views and silhouettes immortalized in the iconography depicting the past.

[8] As a result of this reform, land was surveyed and divided into Polish units of *lan* (about 16.8 ha) and rents in kind were changed to cash benefits.

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