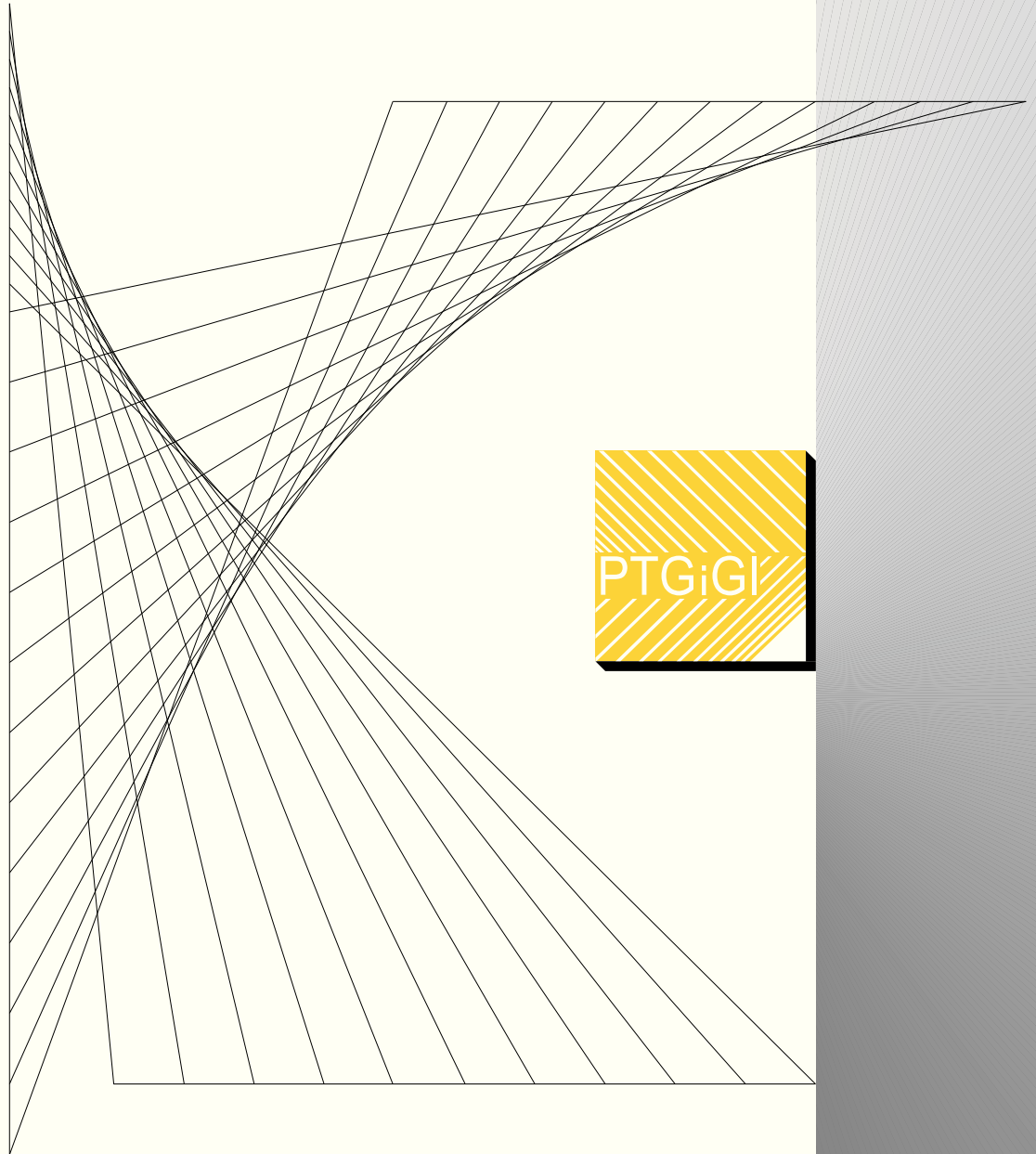


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FOR GEOMETRY AND ENGINEERING GRAPHICS



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DRAWINGS OF FRIEDRICH BERNHARD WERNHER (1690-1776) AND GEOMETRY. PART 1. GENERAL REMARKS

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Abstract. F. B. Wernher, known also as Werner, is the author of many different drawings depicting the views of European towns and urban settlements. These drawings were analyzed multiple times by specialists representing different fields of art and science. The author of this article aims to describe the connection between Wernher's freehand drawings with the methods used in graphical description of constructions. In the article there will be discussed only chosen kinds of drawings and their examples will be presented. Separately, in planned second part of the study, cases of the Wernherian perspective will be discussed.

Keywords: Friedrich Bernhard Wernher (Werner), Silesia, Geometry and Graphics, Projective and Descriptive Geometry, projecting, views, vedutas, maps.

Introduction

The rich life, journeys and work of born in Topola near Kamieniec Żąbkowicki Friedrich Bernhard Wernher (Werner) were subject of many researchers, mostly historians, art historians and architects. According to German researcher Angelika Marsch (1932-2011) he was „*the most active European draughtsman of views in 18th century*” [1/p. 5]. He has drawn maps and views of European towns with buildings situated in them. Among functions he held during his professional activity there were ones connected strictly with cartography in its widest sense and so also with geometry. Wernher used to work for example as bishop's geometrician, prussian king's scenographer and copier of maps in the Royal Prussian War and Domain Chamber in Wrocław. For Augsburg's views' publishers he has been preparing drawings of panoramas, vedutas and plans.

Done with pen and with use of wash technique drawings of Wernher impress and bring lots of information on his times architectural objects. These are, however, drawings, of where the quality of the technique is questionable. In times, when in art, science and technique it was common to interest in geometric rules of projecting, including perspective, people prepared for activity in these fields had knowledge and skills connected with precise notation of information on existing and planned objects. In many craft occupations even in 17th century it was necessary to pass an exam in usage of geometry in design and creating documentation (see [6]).

Wernher was educated in exquisite school in Nysa, which library was very rich. Then he learned the art of engineering in the army. He also took lessons of perspective in Augsburg from woodcutter and painter Carla Remshard (1678-1735) [1/pp. 11]. However, Wernher did not use the classical geometrical methods when creating his drawings. We do not know, if he did not want to, or could not use them. Maybe he was searching for his own ways to solve the problem to draw architecture. These tries were however not appreciated by later drawing receivers. Many of them were criticized. Sometimes it there were very prosaic mistakes

pointed out, like for example different number of axis in the original building and in the drawing depicting them. So it was in case of hospital at the monastery Hospitallers with the Red Star (*Hospital Stifft S. Matthiae*) in Wrocław [5/pp. 283]. Sometimes geometrical incorrectness occurred. The criticism was however done randomly and that is why further research is necessary. Let's take a look then at chosen examples of Werners drawings, depicting towns located in Silesian, included in so called Silesian Topography. It is divided into five parts. It is available in Digital Library of University of Wrocław, and that's the reason for double page numbers in each volume. First information will be presented traditionally as for example „p. 100”, but it is connected with the number written in pencil on the original. The second information regards to electronic copy available on-line and will be written as for example as “e120”. Because of long titles of each part of the Topography whole titles were given presented in the bibliography, and in the text of the article only abbreviations will be used. Picture names were translated. After the translations, in braces there were given the original descriptions.

Titles of Wernhers drawings

Wernher gave titles to most of his drawings. He often also added keys, in which he gave information on particular objects on the drawings and their functions. Often in the titles there was an information on the method of the notation of the space used and the elements filling it. For example in the part describing Upper Silesia, entitled *SILESIA in COMPENDIO..., PARS I* (vol. 3), in the [3/pp. 564-568/e290-292]¹ we find the information on the fact, that it consists of different kinds of drawings:

1. a map (*Carte*), that means map of Upper Silesia (*Carte von Ober Schlesien*);
2. special maps (*Special Charte, Special Chartel* lub *Speciale Chartel*), that means maps of counties, regions and districts;
3. plans (*Plan*), that means plans of cities and other urban settlements; because of different methods of its preparation by Wernhera they should be further divided into:
 - two-dimentional, also called projections (*Grund-Riß*) which as well as maps are projections on horizontal surface (Fig. 1a);
 - three-dimentional; drawings, which are made using a method close to axonometric projecting and depicting urban combinations with full information on their communication (Fig. 2a);
4. views (*Prospect*), mostly panoramas of cities (*vedutas*) (Fig. 1b) and axonometric views depicting „reduced” information on communication combinations (Fig. 2b).

Axonometric plans are different from axonometric views because of different way of dealing with the horizontal plane. It seems, that in case of plans Wernher used to refer to military axonometry, and in case of views to cavalry axonometry.

Some of the drawings have titles, in which the author does not give any information on projecting method applied. In these cases the titles were reduced to name of the presented object or its function and name of the place, where it is situated. Sometimes only location name is given.

It is important to notice, that there is lack of compliance between titles in the table of contents and on the banderoles, which were placed on the drawings.

¹ There is a lack of compliance between the table of contents and the descriptions of the drawings in the keys.



Figure 1: Examples of chosen drawings and its names by Wernher: a/ projection (plan) of Opole before the fire (*Grund-Riß vo Oppeln vorm Brand*) [3/pp. 268-269/e139], b/ view of Opole (*OPPELN in Prospect.*)[3/pp. 236/e123]



Figure 2: Examples of chosen drawings and its names by Wernher: a/ plan of Opole (*OPPELN in PLAN*) [3/pp. 238-239/e124], b/ city of Tarnowskie Góry (*Stadt Tarnowitz.*) [3/pp. 360/e187]

Compilation of many methods in one drawing

Wernher freely made compilations of drawings prepared using different methods of projecting. An example can be a drawing from *Topographia Seu Compendium Silesiae... Pars II* (vol. 4), 4/pp. 303/e157 (bottom) presenting a round logging in a garden next to a church (*Quarteim den*

Lüstgarten zu Kirchen.) Wernher does not give name of the town where the garden is located. It is likely that its located in Borzygniew (*Borganie*), which view with a church and a castle is located on the same page, as the lodging's drawing. The object does not exist currently.

The lodging consists of floors made in centrally-situated circles inscribed into a square. The smallest of them was divided with diameters into sixteen parts of similar dimensions. Four of these parts are creating brown-green cross. Four others, moved by one part of the division, create a white Maltese Cross with dark-green borders. The arms of the Maltese Cross are crossing the smallest circle and are reaching to the outer circular stripe filled with points. These points might be flowers or stones. In ended with indentations arms of the cross there are trees of compact, cylindrical treetops. Another circle is limited by a stripe with threes and objects of small architecture, maybe pedestals with vases.

In the central part of the smallest circle, on the crossing of the crosses, there is an architectural object (a church, chapel or a small palace) and two trees or shrubs in bowls.

The mentioned elements of the lodging were connected together, with lack of compliance with rules of geometry and using different methods of projecting.

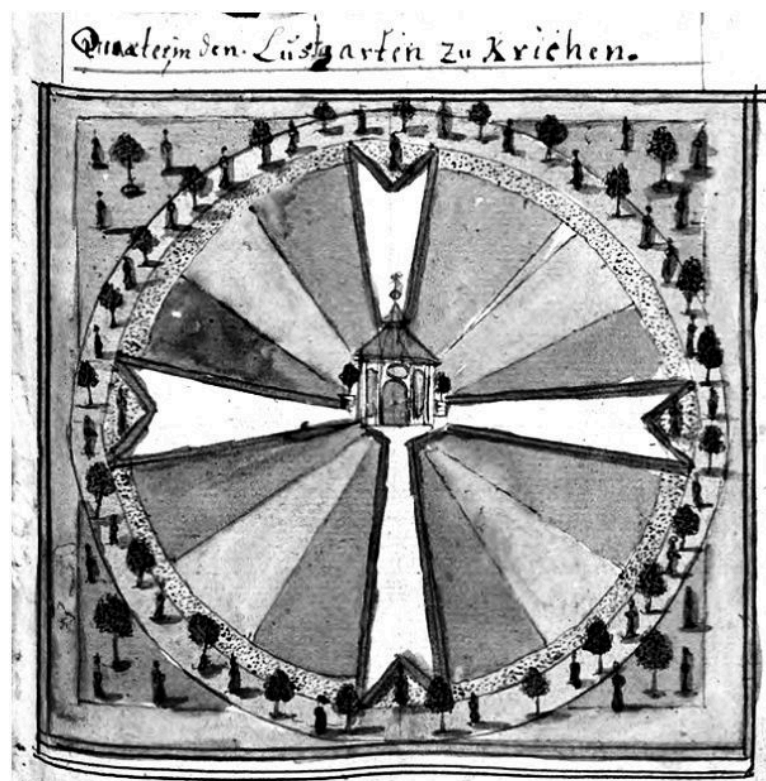


Figure 3: Garden lodging next to a church (*Quarterin den Lüstgarten zu Kirchen.*), likely in Borzygniew (*Borganie*), [4/ pp. 303/e157]

Figure 4 depicts schematic drawings of forms representing each, above-mentioned elements of the lodging. In first column there are presented projections and views of the form, including own and caste shadow, with given illumination of the forms (1a; 2a and 3a). Only in case of the floors (circles and square) projections and views without shades were attached (Fig. 4/ picture 1). Second column presents axonometrics of illuminated forms (1b; 2b and 3b). Third column presents enlarged parts of Wernher's drawing. If the draughtsman constructed the drawing continuously he should choose one method of the notation.

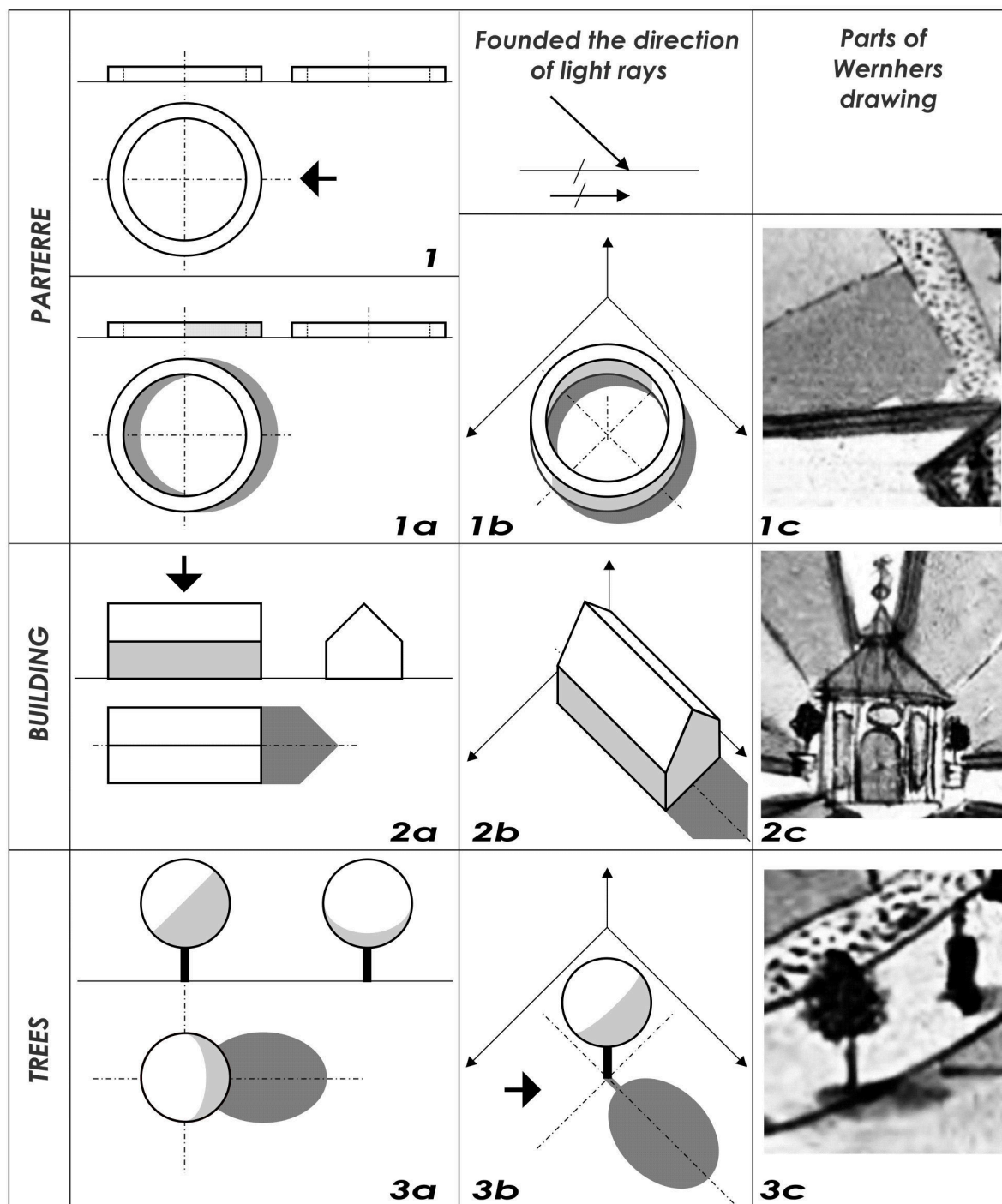


Figure 4: Representation of different forms of graphical notation of information on an object used by Wernher in drawing of garden lodging next to the church (*Quarterin den Lüstgarten zu Kirchen.*)(whole drawing - Fig. 3). The arrows show methods used by Wernher, study by A. Žaba

The artist did however combine together chosen elements (shown with arrows) of the drawings created with different methods of projecting:

- horizontal projection of floors (without shadows) - (Fig. 4/ picture 1);
- view of an architectural object - (Fig. 4/ picture 2a)
- views of trees and pedestals with their shadows, where axonometry can be found – (Fig. 4/picture 3b).

According to the author of this article, even with lack of consequence and geometric incorrectness it can seem for the viewer to be correct, but most of all it gives a full illusion of depth of the presentation.

Wernher also used compilation in another drawing. An example can be a drawing of Gliwice with places nearby (*GLEIWITZ im Prospect mit ümliegender gegend*)[3/pp. 342-343/e178]. The compilation features of the drawing were already found by Piotr Siemko. According to the drawing is showing the city and its neighborhood in the following manner: „[Gliwice] in panoramic view as seen from the north, but the neighborhood were presented from <<above>>, but the neighborhood is however orientated across the east-west axis of the view of the city” [2/ p. 28].

The author of this article beliefs, that the issue is not so obvious, and the drawing is worth another study, among others because of introduced in it corrections of the map.

Conventional signs

In case when important information on the object are situated in locations invisible in chosen view, Wernher reaches for using conventional signs. Example of such activity are wheels of watermills (see Fig. 5).

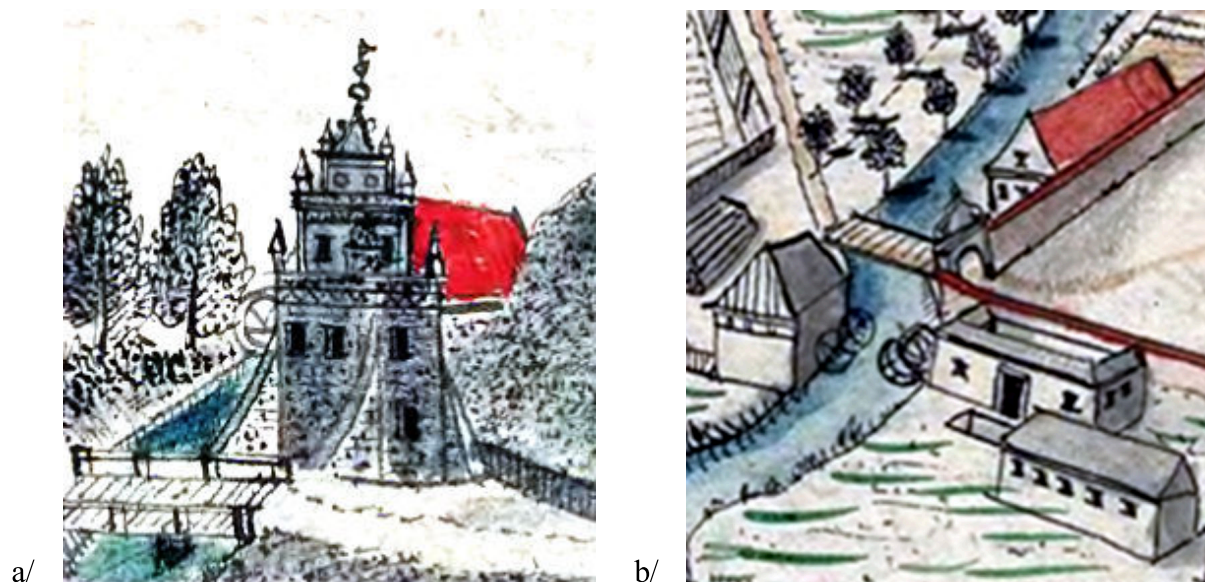


Figure 5: Watermills with wheels situated perpendicularly to the river: a/ duke's mill at Nysa river – a part of the drawing of castle in Otmuchów (*Schlos zů Ottmachau*)[3/p. 467/e240], b/ Cistercian mills at Ruda river – part of drawing of monastery in Rudy Wielkie (Raciborskie) (*Closter RAUDEN Cistercienser ordens*)[3/pp. 110-111/e60]

Wheels on the drawings were situated in perpendicular plan to the river, which energy is running the mill. Geometrically incorrect pictures of the wheels are however, according to the author of this article, fully justified. With given directions of observing the mill walls, the wheels at them were invisible. The observer had then no chance to see the wheels. Not Seeing the wheels, he would not know that the buildings are watermills.

Summary

Drawings of Wernhera are made by hand, but sometimes its author introduces elements made using „drawing instruments”. In many of the drawings there are introduced elements showing, that the author does consciously refer to methods used in descriptive geometry. In his works

the author inconsequently uses geometrical methods of notation of information on urban settlements and architectural objects as well as inconsequent titles. Compilation of geometrical methods in one drawings makes it impossible to bring back the shape and size of presented elements.

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RYSUNKI FRIEDRICHA BERNHARDA WERNHERA A GEOMETRIA CZEŚĆ 1 . UWAGI OGÓLNE

F. B. Wernher (1690-1776), znany również jako Werner, jest autorem wielu rysunków przedstawiających widoki europejskich miejscowości i założeń urbanistycznych. Rysunki te były wielokrotnie analizowane przez specjalistów z różnych dziedzin sztuki i nauki. Autorka artykułu podejmuje próbę opisanie związku odręcznych rysunków Wernhera z metodami wykreślnymi stosowanymi w graficznym zapisie konstrukcji. W artykule omówione zostaną jedynie wybrane rodzaje rysunków i przedstawione ich przykłady. Osobno, w planowanej drugiej części opracowania, zostaną omówione przypadki „wernherowskiej perspektywy”.