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## STRUCTURAL MORPHOLOGICAL ANALYSIS OF ORDER SYSTEM IN LVIV ARCHITECTURE OF INTERWAR PERIOD

## STRUKTURALNA ANALIZA MORFOLOGICZNA PORZĄDKU ARCHITEKTONICZNEGO W ARCHITEKTURZE LWOWA OKRESU MIĘDZYWOJENNEGO

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### ABSTRACT

A structural morphological analysis of architectural order has been conducted with a view to study the specific features of order structure on Lviv buildings of interwar period. The study also includes proportional analysis of the façade and order as well as general modular and comparative analysis. The author researches trends in the development of order structure during the period specified and compares the results obtained with classical samples of the Renaissance period.

Keywords: interwar period, Lviv, modular analysis, morphological analysis, order, proportional analysis.

### STRESZCZENIE

Przeprowadzono strukturalną analizę morfologiczną ładu architektonicznego w celu zbadania specyficznych cech struktury porządkowej budynków Lwowa, okresu międzywojennego. Badanie obejmuje również analizę proporcjonalności fasad i porządku, a także ogólną analizę modułową i porównawczą. Autor bada trendy w rozwoju struktur budynków w podanym okresie i porównuje wyniki uzyskane z klasycznymi wzorcami okresu renesansu.

Słowa kluczowe: analiza modułowa, analiza morfologiczna, analiza proporcjonalna, Lwów, okres międzywojenny, porządek architektoniczny.

## 1. INTRODUCTION

The article presents a study of the façades of Lviv buildings of interwar period that have order on them. Chronological framework of the research is the period between the two World Wars (1919-1939). During that time, Lviv was under the rule of Second Polish Republic. The city became administrative center of Lviv voivodeship. It was one of the biggest social and political, educational and cultural centres of the Second Polish Republic.

Lviv architecture of interwar period was formed by many architectural trends. Stylistic trends of the time included "manorial style" (styl dworski) – the-so called folk architecture, neoclassicism of the early 20<sup>th</sup> century – synthesis of modernism and classical styles, modernism – a style characterized by brave positioning of architectural volumes, simplicity of shapes, logics of structure, extensive range of functions.

Lviv architecture of interwar period was researched by Yu. Bohdanova [1], B. Cherkes [2], R. Cielątkowska [3], L. Hrytsyuk [4], T. Klymenyuk [6], S. Linda [2], T. Lypka [9], W. Minkiewicz [11], R. Mykh [16], H. Petryshyn [14], T. Trehubova [16], I. Yakubovskiy [17] and others. A number of papers are dedicated to modernist architecture, which was a new style in the early 20<sup>th</sup> century, while order system of the same period, namely its morphology, was little researched and requires further study. Manorial and neoclassical architecture need further research as order is a typical element for the architectural and compositional design of the façades of such buildings.

Early 20<sup>th</sup> century is marked by the emergence of "manorial style" (1908-1928) which is a branch of folk architecture representing the development of advanced architectural thought as well as search for a new image that would establish a compromise between modern trends and the architecture of previous years. It is one of the branches of so-called national style, which in Lviv was in most cases characteristic for individual houses. Architects turn to architecture of a typical 18<sup>th</sup> century manor with its characteristic portico with slim columns [3]. This type became popular in interwar period after 1918. A large amount of manorial style buildings was constructed in Warsaw and Eastern Poland. In the second part of 1920s, the manorial style, spawned by the romantic dream about national Polish style, started giving place to different forms of modern architecture [12].

In 1920s Neoclassicism (1910-1930) was a dominant trend which represented new ideas in architecture development but was still maintaining the classical traditions in façade composition [8, p. 531]. Characteristic for the modernized classics are shapes that employ reimagined classical details. History of modernized classics shows the desire for relevant architectural forms to combine contemporary public, technical, aesthetic and other aspects with the ideal of architecture expressed in classics, which is not connected to time and purpose of its appearance. People are coming back to order architecture as a symbolic sign of architectural ideal, universally understood for the client, executor and consumer, while also taking into account modern needs. Examples of literal "citing" of classic orders were accompanied by attempts at geometrization and simplification of their forms [7].

## 2. METHODS OF INQUIRY

Architectural morphology is a branch of morphology aimed at studying the structure of architectural object from the standpoint of its architectural and spatial, artistic and other characteristics [15, p.25].

**Morphological analysis** is the analysis of shape and structure of architectural object. It foresees the method for determining character and history of the development of different architectural objects and their parts [13, p.25]. Morphological analysis of architectural order is necessary for the analysis of its structure and determining the main features of order, such as its place on the façade, size and ratio of its parts and elements.

Structural analysis is a method of inquiry of static (constant) characteristics of a hierarchal system by means of singling out subsystems and different level elements within it and determining the relations and connections between them. The subjects of research in structural analysis are different variants of constructions which may be revealed in the process of decomposing a system, helping to conduct a comprehensive assessment of the system in general.

In order to conduct structural morphological analysis of architectural order, a proportional analysis of order and façade has been completed along with compositional analysis of order positioning on the façade, modular and comparative analysis on the whole.

**Proportional analysis of the façade.** One of the most important methods for creating a distinct comprehensive architectural form is proportioning – a technique of architectural composition and organization of architectural form with regard for size ratios of its separate parts (elements) and subsequent harmonization of such ratios in a certain system. Proportional links between elements may be expressed in ratios of linear sections and geometric similarity of shapes.

There are two types of proportional ratios – arithmetic (integer proportions) and geometric (irrational proportions).

Geometric shapes with simple integer ratio of sides are – a square (1:1), rectangle of two squares (or double square) (1:2), right-angled triangle with side ratio 3:4:5 used in Ancient Egypt, the so-called "Sacred Egyptian triangle". The ratio of leg to hypotenuse is 3:4:5 and it is the only triangle in which side lengths create an arithmetic series.

The irrational ratios include golden triangle with side ratio of 1:0.618, Hambidge's "dynamic rectangles" (or "irrational" rectangles with side ratio of  $1:\sqrt{1}$ ,  $1:\sqrt{2}$ ,  $1:\sqrt{3}$ ,  $1:\sqrt{4}$ , ...), Le Corbusier's Modulor, Zholtovsky's "live square" ( $a:b = 1.118$ ). Antique proportions are based on irrational ratios.

An important method of proportioning in architecture is the method of geometric similarity of shape. Very often, the similarity of rectangles is used. Direct proportion observed in similarity of triangles is expressed in ratio  $a:b = a:c$ . The sign of similarity in this case is parallel or perpendicular location of diagonals with respect to the shapes.

Diagonals of similar rectangles are parallel if big (or small) sides are placed in parallel and are perpendicular when triangles are rotated by  $90^\circ$ . Such location of diagonals is a sign of shape similarity and, thus, is indicative of direct proportion.

The technique of unifying the composition by aligning rectangular shapes is often used in architecture. It may be observed on buildings of different periods in the history of architecture.

Geometric similarity of shapes as an expression of direct proportionality was referenced by Ancient Greek mathematician Euclid. The principle of geometric similarity was used as early as Ancient Greece to establish proportion between big parts of a building and their details (order in general and details of the Temple of Poseidon at Paestum, 5<sup>th</sup> century B.C.). Geometric similarity helped tie together the main parts of a complicated asymmetric system of shapes in Erechtheion, Athens. In its purest form, this technique was used in the architecture of Ancient Rome. Thus, a rectangular part of the Arch of Trajan opening in Ancona is similar to vertical rectangle characteristic for the whole structure. The same shape, if rotated by  $90^\circ$ , follows the shape of the high stylobate [5, p. 84].

Specific features, extremely important for the creation of proportionality, emerge in a geometrical proportion called "golden ratio". "Golden ratio" is the division of a section into two unequal parts in such a way that their ratio is the same as the ratio of their sum to the larger of the two quantities. It was of importance back in Ancient times and Italian Renaissance architects also considered it extremely important.

The specific feature of "golden ratio" is that this ratio ties together the ratios between parts and the whole. A continuous string of "golden ratio" expresses the idea of dividing the whole into similar parts in such a way that the parts when put together can restore the initial size.

In numerical expression the "golden ratio" string may look as follows: ... 0.056; 0.090; 0.146; 0.236; 0.382; 0.618; 1.0; 1.618; 2.618 ... etc. The ratio of any two neighbouring numbers in the string is 0.618. At the same time, each successive number is sum of the two previous ones.

Another principle of proportioning in architecture is Hambidge's dynamic rectangles row. It is a continuous system of rectangles in which the first one is a square and each successive one is built on the side of original square, which is 1, and the diagonal of the previous rectangle. This results in a series of rectangles with side ratio made of the following row:  $\sqrt{1}$ ,  $\sqrt{2}$ ,  $\sqrt{3}$ ,  $\sqrt{4}$ ,  $\sqrt{5}$ , ...

Proportional analysis helps reveal analogies in ratios and sizes, discover trends in ratio and size change, establish working rules used to determine proportions and sizes of constituent elements of structures, learn the changes in proportions with regard for scale, conduct metrological analysis of size and determine the logics behind shaping of certain architectural structures.

Upon completion of proportional analysis of the façade, an analysis is conducted of the interconnection between the main methods of façade proportioning and order layout on them.

**Proportional analysis of order.** Order system was an integral method of façade design during many periods. Many architectural theoreticians dealt with order research and were trying to determine order canons. Vignola's rules of order creation were used as basis for the proportional analysis of order. His works were based on studies, measurements and sketches of the antiquities. Vignola created his rules by summarizing the data he obtained while trying to find average, most common and universal values. Conciseness, definiteness and simplicity of the suggested calculation methods stipulated extreme popularity of Vignola's textbook. What he developed was an abstract canon – he picked out certain characteristics from a wide variety of antiquities, generalizing them and constructing into one whole.

The ratio between height and diameter of a column are a constant feature for each order according to Vignola. For all the five orders, he establishes the same rule: the pedestal is 1/3 of column with base and capital while the entablature (including architrave, friso and cornice) is 1/4 of the column.

In such a way, in order to construct an order the general height is divided into 19 parts, 12 of which make up the column height, 4 – pedestal height and 3 – entablature height. Simultaneously, for incomplete orders (without pedestal) the height is made up of 15 parts respectively. Stemming from the height of column and height-diameter ratio, which is constant for each order, a module equal to the height of lower column diameter is distinguished.

Proportional analysis of order helps determine whether the proportions of the key elements of order, in particular, column, pedestal and entablature, are kept in Lviv architecture of interwar period.

**Modular analysis of order** presupposes determining the ratio of order to module – lower diameter or column radius.

For all architectural parts of each of the five orders numerical ratios are established, which are based on lower radius of the column. According to Vignola, the height of column should be made of 14 modules in Tuscan order, of 16 modules in Doric order, of 18

modules in Ionic order and of 20 in Corinthian and Composite order. The size of other parts and details are determined with respect to module.

This paper takes lower column radius as module and on this basis determines modular values of the other order elements, which are later compared to module values of architectural orders according to Vignola.

**Comparative analysis of order on the whole.** In the course of comparative analysis, an object is studied in comparison to identical items of the same historical period or the same typological row.

Comparative analysis of order on the whole foresees comparison of the proportions and modules of orders in general as well as their key elements without analyzing small details (architectural breaks).

Comparative analysis was used to compare order on the façades of Lviv buildings of interwar period with classical prototypes in order to determine the changes which happened during the use of architectural order. In the course of comparative analysis, we used data obtained during previously conducted proportional and modular analyses.

On the basis of proportional analysis of the façade and order, compositional analysis of order layout on the façade, modular and comparative analyses on the whole, a structural morphological analysis has been conducted which was later used to analyze changes in the structure of order, parts of its elements and details during various stages of architecture development in Lviv of interwar period.

Based on on-site studies, a classification has been developed for the buildings and structures of interwar Lviv that have architectural order on them along with classification of order itself. In addition, a structural morphological analysis has been conducted which consists of proportional analysis of the façade and order, compositional analysis of order layout on the façade, modular and comparative analysis on the whole.

### 3. MORPHOLOGICAL ANALYSIS OF ORDER IN LVIV ARCHITECTURE OF INTERWAR PERIOD

The author has conducted a comprehensive study of 60 buildings of interwar period. On the basis of technical drawings of Lviv interwar façades a structural morphological analysis has been conducted which consists of proportional analysis of the façade and order as well as modular and comparative analyses.

Based on conducted **proportional analysis of façade drawings**, a link has been established between primary methods of façade proportioning and order layout on the façade. The main proportions used in construction of façades in interwar Lviv which used architectural order were: square (1:1), rectangle of two squares (or double square) (1:2), golden ratio rectangle with side ratio of 1: 1.618 and Hambidge's "dynamic rectangles" (or irrational rectangles with side ratio of  $1:\sqrt{1}$ ,  $1:\sqrt{2}$ ,  $1:\sqrt{3}$ ,  $1:\sqrt{4}$ , ...) (fig. 1-8, a). Besides, the method of geometric similarity of shapes, in particular rectangles, was used. As a result of proportional analysis of Lviv façades and the analysis of order layout on them, it has been established that the layout in most cases coincides with the traditional proportional schemes used on the façades which testifies to the fact that order is one of the main means of compositional design of façades.

**Modular analysis** revealed the main correlations between order elements and the module. For the façades of Lviv buildings of interwar period we took the lower radius of column or 1/2 of pilaster width as module and determined modular values of other parts of order correspondingly (fig. 1-8, b). During comparative analysis on the whole we compared columns and pilasters on Lviv façades of interwar period with classic samples, namely Vignola's orders as the most universal ones. For all architectural parts of each of the five orders numerical ratios have been established which are based on lower radi-

us of the column. According to Vignola, column height in Tuscan order should be comprised of 14 modules (or 7 diameters), 16 M (8 diameters) in Dorian order, 18 M (9 diameters) in Ionic order, 20 M (10 diameters) in Corinthian and Composite orders. Entablature height in Tuscan order according to Vignola is 3.5 M, in Doric order – 4 M, in Ionic order – 4.5 M, Corinthian and Composite – 5 M. The height of pedestal in Tuscan order is 4 2/3 M, in Doric – 5 1/3 M, in Ionic – 6 M, in Corinthian and Composite – 7 M. The size of other parts and details is determined with respect to module (Table 1).

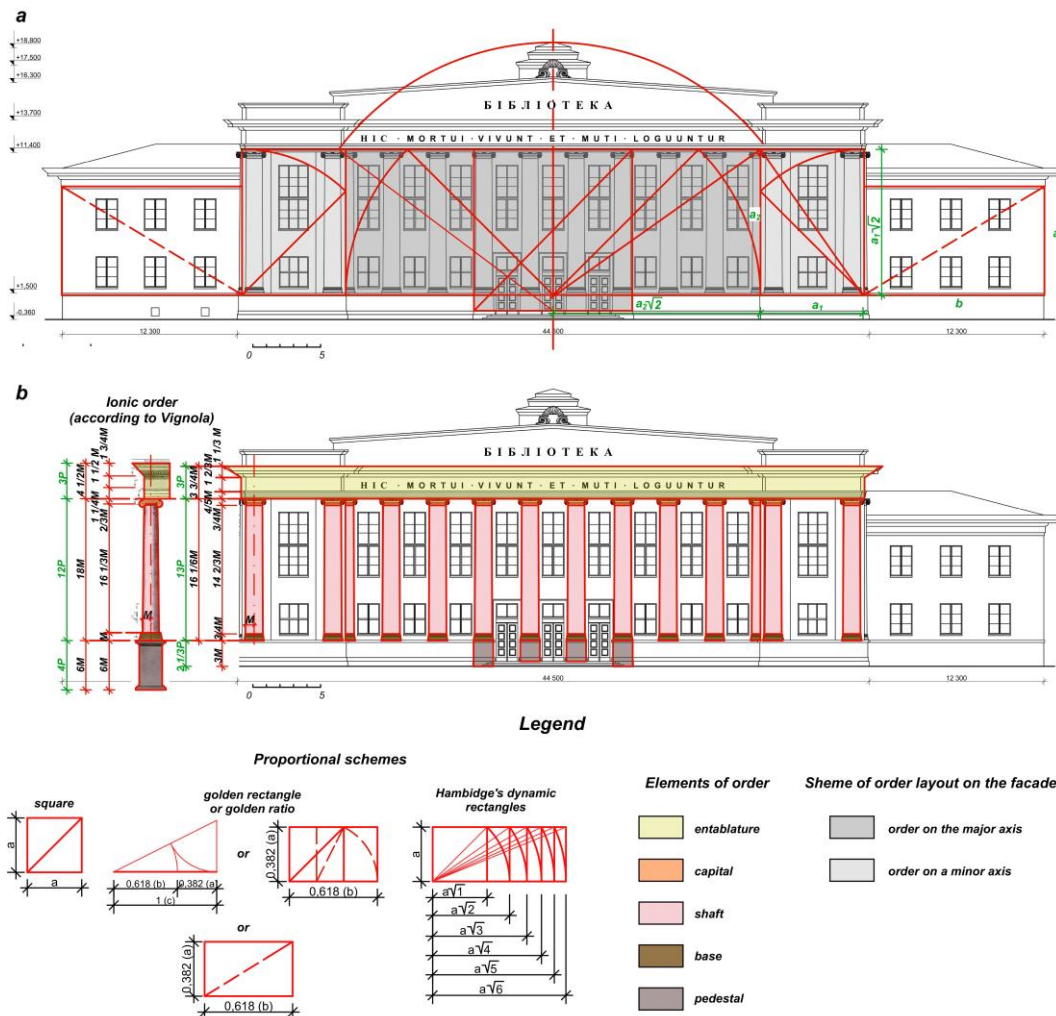


Fig. 1. Scientific Library of Lviv Polytechnic at 1 Profesorska St. (Nikorovycha St.), (arch. T. Obminskyi (1928-1930): a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author



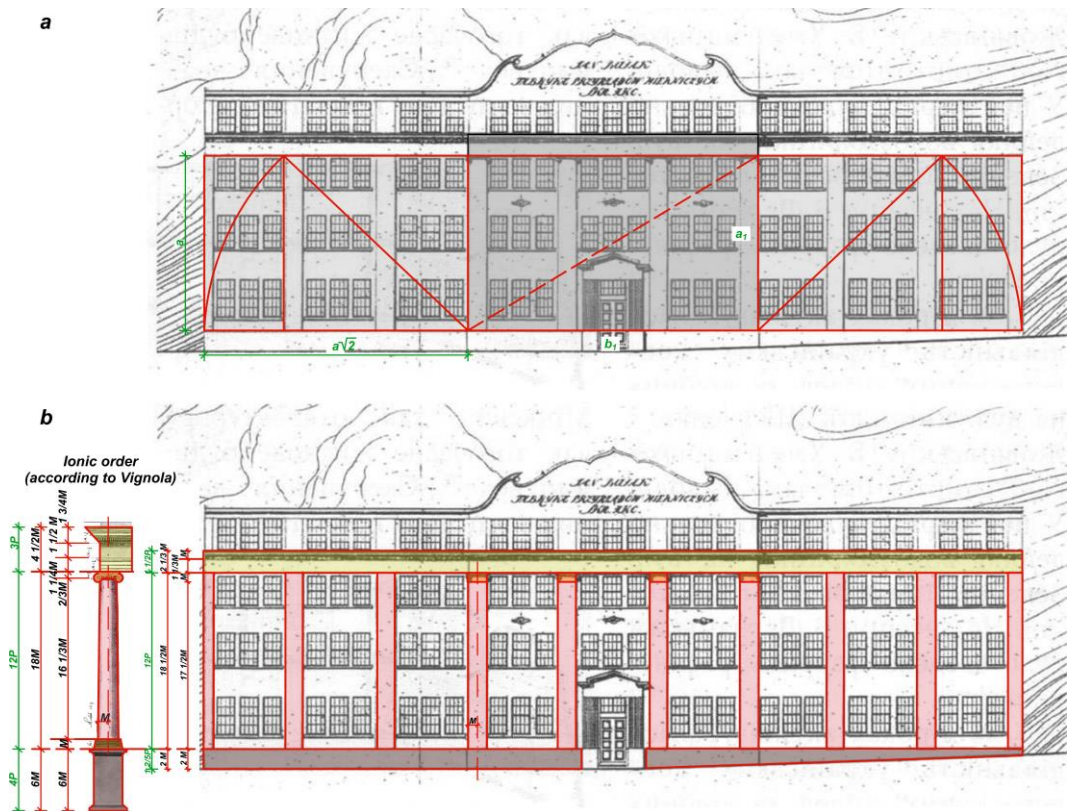


Fig. 2. Ya. Buyak's factory (façade design, 1925) on the corner of Hryunvaldska and Antonovycha St.: a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author

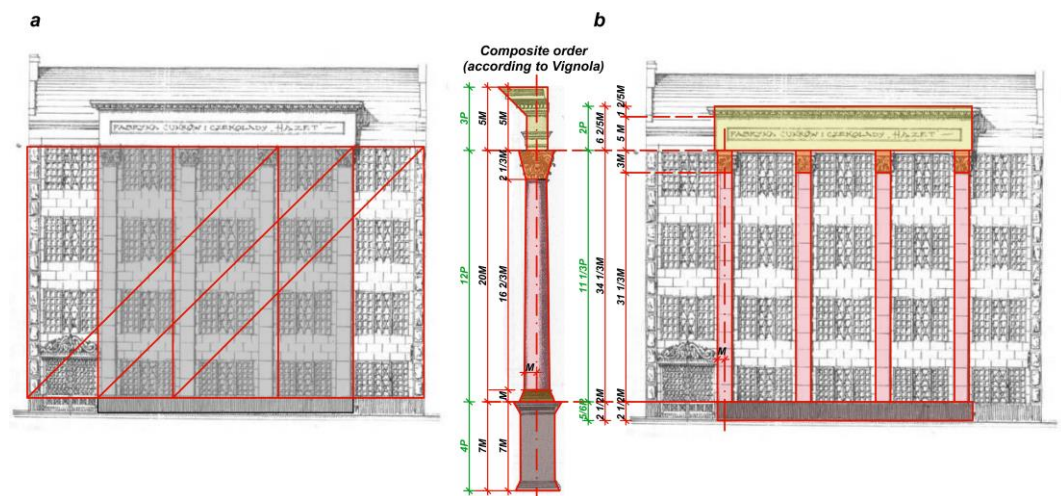


Fig. 3. HAZET Confectionery Company (Branch of Svitoch Confectionery Company), 23 Zavodska St. (Panenska) (arch. I.-M. Sobel, 1922): a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author

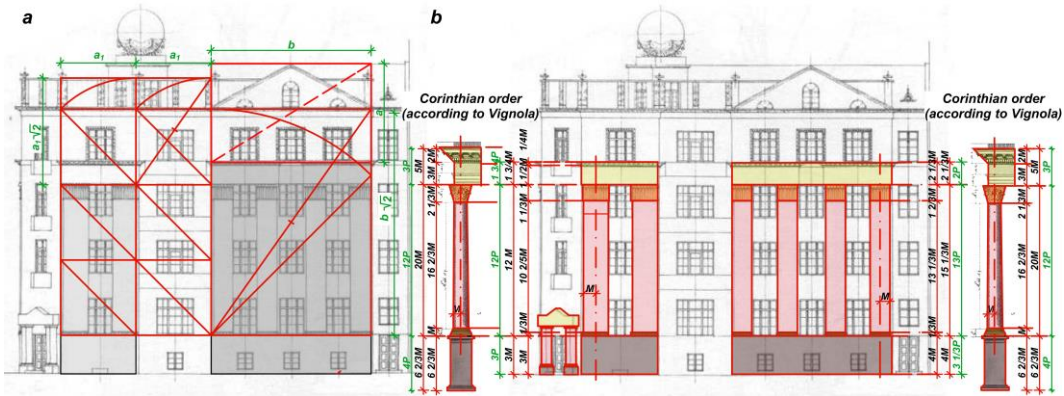


Fig. 4. "The Emigrant's House" (Gynecological Department of the Fifth Hospital) on the corner of 4 Rusovych St. (Vyshniiovetskykh St.) and 12 Konovaltsia St. (29 Lystopada St.) (design by H. Zarembo's construction company, 1920s, significantly simplified during actual construction in 1930) a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author

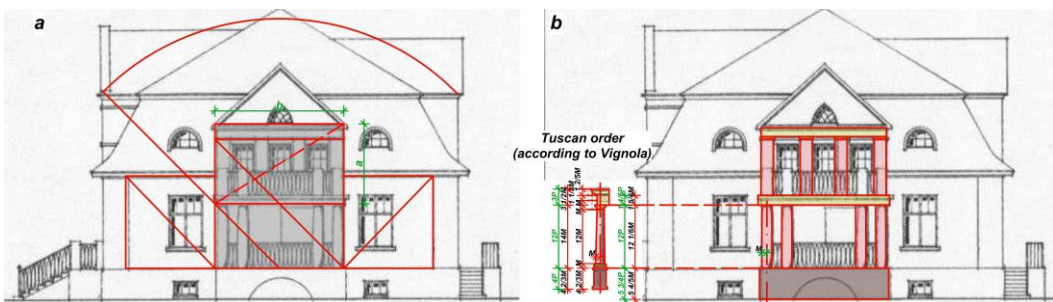


Fig. 5. Villa (now Academic Block No. 29 of Lviv Polytechnic National University) at 6 Kvitneva St. (arch. Ch. Miller, 1925): a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author

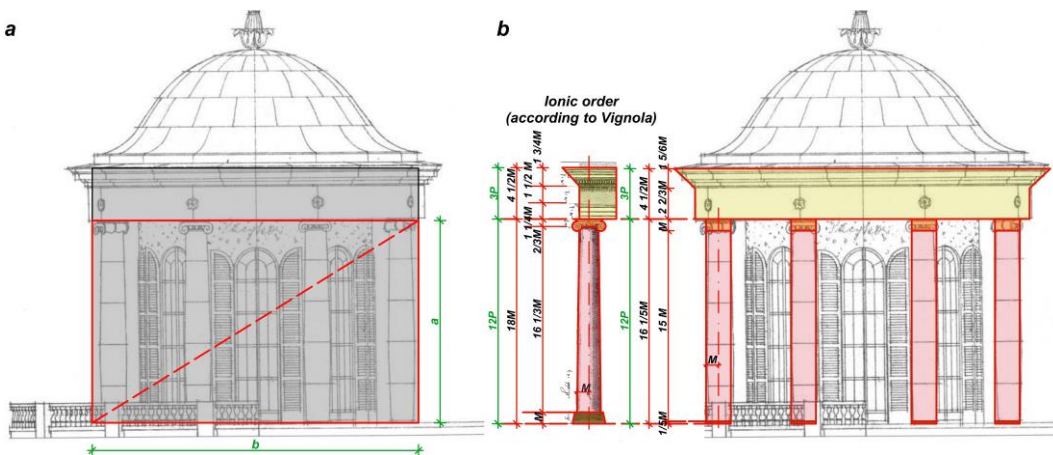


Fig. 6. Rotunda of Patsyivska Factory during the Eastern Trade Fair, Stryiskyi Park (A. Zachariwicz, Ye. Cherwinski, 1926): a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author



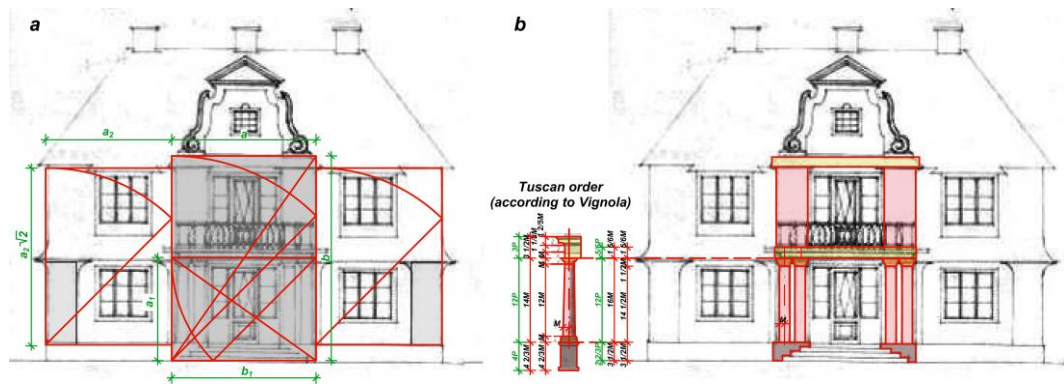


Fig. 7. The house of attorney, Doctor Yuzef Bach, 17 P. Myrnoho St. (arch. K. Weiss (1925-1934): a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author

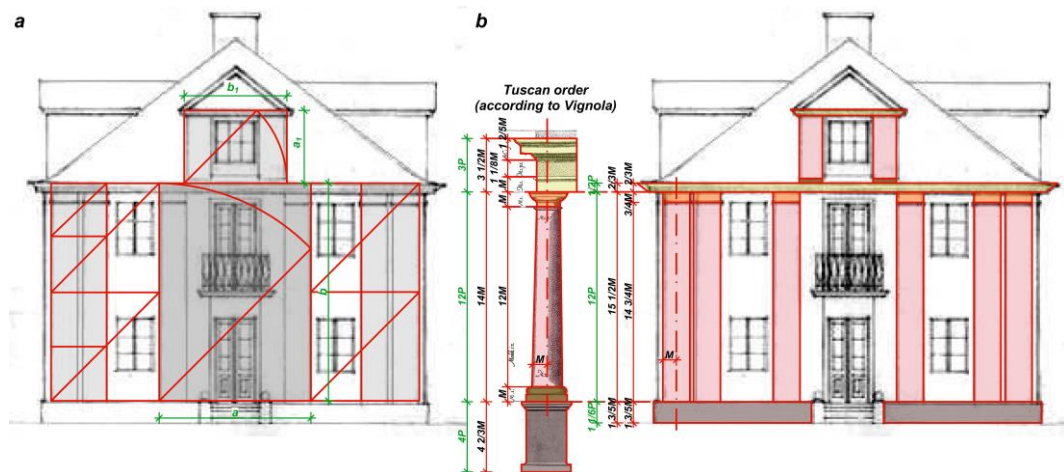


Fig. 8. Villa (part of Vlasna Strikha (Own Roof) residential cooperative), 22 P. Myrnoho St. (standard project No. 3, arch. K. Weiss (1925-1933): a) proportional analysis of the façade and order layout scheme; b) modular and proportional analysis of order. Source: schemes designed by the author

Pilasters and columns in Tuscan order on Lviv façades of interwar period have the height of  $8 \frac{2}{5}$  -  $30 \frac{2}{3}$  M, entablature –  $3 \frac{3}{5}$  -  $10 \frac{2}{3}$  M, pedestal –  $1 \frac{3}{5}$  -  $5 \frac{4}{5}$  M. In Doric order column/pilaster height makes up 16 M, entablature height is  $3 \frac{4}{5}$  - 5 M and the pedestal is not used. The height of column/pilaster in Ionic order ranges between  $16 \frac{1}{6}$  and  $25 \frac{1}{3}$  M, entablature is between  $2 \frac{1}{3}$  and 5 M and pedestal is between 2 and  $9 \frac{1}{5}$  M. Column/pilaster in Corinthian order is 20 M, entablature is  $5 \frac{1}{2}$  M and the pedestal is not used. The height of column/pilaster in Composite order ranges between 16 and  $34 \frac{1}{3}$  M, entablature is between  $1 \frac{2}{5}$  and  $6 \frac{2}{5}$  M and pedestal is between  $1 \frac{2}{3}$  and 4 M. The height of column/pilaster in stylized order ranges between  $8 \frac{1}{2}$  and  $22 \frac{4}{5}$  M, entablature is between  $1 \frac{3}{4}$  and  $4 \frac{3}{4}$  M and pedestal is between  $1 \frac{1}{4}$  and 8 M.

In Tuscan order, ratio of column diameter to its height (d:h) ranges between 1:4 (with column height of  $8 \frac{1}{2}$  M) and 1:15 (column height of  $30 \frac{2}{3}$  M) (according to Vignola d:h = 1:7 with column height of 14 M). In Doric and Corinthian order, ratio of column diameter to its height (d:h) complies with classical canons and equals d:h = 1:8 for the Doric order with column height of 16 M and d:h = 1:10 for the Corinthian order with column height of 20 M. Ratio of column diameter to its height in Ionic order is d:h = 1:8 – 1:13 (with column height of  $16 \frac{1}{6}$  -  $25 \frac{1}{3}$  M) (the canonic ratio is 1:9 with column height of 18 M), in com-

posite order –  $d:h = 1:8 - 1:17$  (with column height of 16 - 34 1/3 M) (the canonic ratio is 1:10 with column height of 20 M) and stylized order –  $d:h = 1:4 - 1:11$  (with column height of 8 1/2 – 22 4/5 M). Thus, the height of columns in interwar period changes in relation to the diameter and is bigger or smaller as compared to Renaissance samples.

Table 1. Modular and proportional analysis of order on the façades of Lviv buildings of interwar period. Source: original analysis conducted by the author

Tuscan order							
No.	Street	Column		Entablature		Pedestal	
		Modules	Parts	Modules	Parts	Modules	Parts
1	Basarab, 1	11	12	12	12	-	-
2	Br. Mikhnovskyykh, 4	9 3/5	12	35	34	1 4/5	2 1/5
3	Horodotska, 276	9 2/5	12	1 1/2	2	2 4/5	3 3/5
4	Horodotska, 278	8 2/5	12	2	2 2/3	2	2 5/6
5	Horodotska, 280	11	12	1	1 1/5	2 1/3	2 1/2
6	Zamarstynivska, 134	12 1/3	12	4	4	2 1/5	2 1/6
7	Kvitneva, 6	12 1/6	12	1 5/6	1 4/5	5 4/5	5 3/4
8	Konovaltsia, 99	9 3/4	12	35	34	1 1/2	1 4/5
9	Konopnytskoyi, 3	30 2/3	12	10 2/3	1 4/5	2	4 1/6
10-13	Myrnoho, 1, 11, 21, 22	15 1/2	12	23	12	1 3/5	1 1/6
14-18	Myrnoho 11a, 15, 17, 19, 25	13 1/2; (16 project)	12; (12 project)	2; (1 5/6 project)	1 5/6; (1 2/5 project)	-; (3 1/2 project)	-; (2 2/3 project)
19-23	Myrnoho 3, 5, 7, 9, 23	16	12	1 5/6	1 2/5	-	-
24	Mushaka, 17	18 1/2	12	2	1 1/4	2	1 1/3
25	Ostrohradskyykh, 1	14 1/2	12	2	1 2/3	-	-
26	Samchuka, 15	8 1/2	12	23	1	1 4/5	2 1/2
27	Samchuka, 17	17	12	2	1 2/5	-	-
28	Sakharova, 2	12	12	-	-	1 2/3	1 2/3
29	Svientsitskoho, 2	16	12	4 1/2	3 1/3	3 1/4	2 1/3
30	Stryiskyy park ("Horseshoe" pavilion)	15	12	1	3/4	-	-
31	Stryiskyy park ("Horseshoe" pavilion)	12	12	3 4/5	3 4/5	-	-
32	Franka, 157	22 1/3	12	3 2/3	2	-	-
Doric order							
No.	Street	Column		Entablature		Pedestal	
		Modules	Parts	Modules	Parts	Modules	Parts
33	Slovatskoho, 1	16	12	5	3 3/4	-	-
34	Franka, 150	16	12	3 4/5	2 5/6	-	-
Ionic order							
No.	Street	Column		Entablature		Pedestal	
		Modules	Parts	Modules	Parts	Modules	Parts
35	Boy-Zhelenskoho, 5	19 1/2	12	4	2 1/2	-	-
36	Hryunvaldska (factory project)	18 1/2	12	2 1/3	1 1/2	2	1 2/5
37	Zavodska, 23	25 1/3	12	5	2	9 1/5	4 1/3
38	Profesorska, 1	16 1/6	12	3 3/4	2 3/4	3	2 1/4
39	Stryiskyy Park (Patsykyvska factory pavilion)	16 1/5	12	4 1/2	3 1/3	-	-
40	Ustyanyovycha, 5	18 1/3	12	4	2 2/3	2 3/4	1 4/5

Table 1. (continuation). Modular and proportional analysis of order on the façades of Lviv buildings of interwar period. Source: original analysis conducted by the author

Corinthian order							
No.	Street	Column		Entablature		Pedestal	
		Modules	Parts	Modules	Parts	Modules	Parts
41	Sviatsitskoho, 2	20	12	5 1/2	3 1/3	-	-
Composite order							
No.	Street	Column		Entablature		Pedestal	
		Modules	Parts	Modules	Parts	Modules	Parts
42	Vitovskoho, 35	20 1/3	12	4	2 1/3	4	2 1/3
43	Zavodska, 23 (project)	34 1/3	12	6 2/5	2 1/5	2 1/2	5/6
44	Kovzhuna, 10	16 1/2	12	2 1/2	1 4/5	1 2/3	1 1/5
45	Kopernyka, 42a	19 2/3	12	4 1/3	2 2/3	-	-
46	Stryiskyi Park (Sarotti pavilion)	16	12	1 2/5	1	-	-
47	Franka, 23	22 1/2	12	4 5/6	2 1/2	-	-
Stylized order							
No.	Street	Column		Entablature		Pedestal	
		Modules	Parts	Modules	Parts	Modules	Parts
48	Antonovycha, 47	21	12	3 1/3	1 5/6	-	-
49	Hryunvaldska, 11a	18	12	5	3 1/2	-	-
50	Horodotska, 42	22 4/5	12	2 1/2	1 1/3	-	-
51	Horodotska, 132	22 1/2	12	4 1/2	2 1/3	3	1 2/3
52	Doroshenka, 26	12 1/4	12	-	-	-	-
53	Dudayeva, 19	18 5/6	12	3 1/4	2	-	-
54	Konovaltsia, 24	22 2/5	12	3 1/6	1 2/3	-	-
55	Mushaka, 17	11 2/5	12	2 1/2	2 2/3	8	8 2/5
56	Halytska Square, 15	22 1/3	12	3 5/6	2	4 1/2	2 2/5
57	Rusovykh, 4	12, 15, 1, 3	12, 12	1 3/4; 2 1/3	1 3/4; 1 3/4	3, 4	3, 3
58	Samchuka, 9	20 1/5	12	3 2/3	2 1/6	-	-
59	Stetska, 11	21 1/4	12	4 3/4	2 2/3	-	-
60	Stryiskyi Park (Polish Commercial Bank pavilion)	8 1/2	12	1 4/5	2 1/2	1 1/4	1 2/5
61	Stryiskyi Park (Land Credit Bank pavilion)	12 4/5	12	-	-	-	-

**Proportional analysis** of order showed the correlation between entablature and pedestal height to the column. For this purpose, in present study all columns of all orders had 12 parts and the ratios of entablature and pedestal have been determined in accordance to such values (fig. 1-8, b). Complete classical order consists of 19 parts: column – 12 parts, entablature – 3 parts, pedestal – 4 parts (12:3:4), incomplete order consists of 15 parts: column – 12 parts and entablature – 3 parts (12:3). In Tuscan order, the ratio of entablature to column ranges between 1/2: 12 - 3 4/5: 12 Parts (P), and the pedestal to column – 1 1/6: 12 - 5 3/4: 12 P. In general, during interwar period the ratio of entablature to pedestal is decreased as compared to the classical example meaning that the column becomes higher. In buildings with Doric order, entablature proportions are close to classical and equal 2 5/6: 12 P and 3 3/4: 12 P, the pedestal is not used. In Ionic order the height of entablature and pedestal is normally smaller than in classical order similar to Tuscan order and ranges between 1 1/2: 12 - 3 1/3: 12 P and 1 2/5: 12 - 4 1/3: 12 P for the ped-

estal. Entablature height in Corinthian order and column height have the ratio of  $3 \frac{1}{3}$ : 12 P with no entablature. In buildings with Composite and stylized order entablature and pedestal height are usually smaller than in analogs of Italian Renaissance. Entablature height in Corinthian order and column height have the ratio of 1: 12 -  $2 \frac{4}{5}$ : 12 P, in stylized –  $1 \frac{1}{3}$ : 12 -  $3 \frac{1}{2}$ : 12 P, pedestal and column height ratio in Composite order is  $\frac{5}{6}$ : 12 -  $2 \frac{1}{3}$ : 12 P, in stylized –  $1 \frac{2}{5}$ : 12 -  $8 \frac{2}{5}$ : 12 P (Table 1). Thus, in most cases the ratios between the main parts of order on the façades of Lviv buildings have not been kept – for the most part entablature and pedestal height was decreased in relation to column height.

In addition, a comparative analysis of order on the whole has been conducted in which a comparison has been made between Lviv orders of interwar period and Vignola's canonic examples. In construction of Lviv buildings of interwar period the main rules of order structure have been kept, namely its division into three main structural parts – pedestal, column and entablature or into two parts in case of incomplete order – column and entablature. Yet, the division of these main parts into smaller elements is not always preserved. Thus, a classical column is divided into base, body of the column and capital, the pedestal is divided into base, body and cornice and the entablature is divided into architrave, friso and cornice. In the studied objects of interwar Lviv we have discovered that not all elements of column, pedestal and entablature are always used.

In the course of study, it has been established that rules were often bent when order was implemented. In view of the fact that Vignola and other theoreticians created their own rules after studying a number of antiquities and arrived at average values based on many individual cases, small violations of rules required for composition in each specific case are acceptable. Nevertheless, in column proportioning the violations in ratio of width to height, size of base to capital is almost never acceptable. At the same time, pedestal height during Renaissance was often decreased to factor in absolute scales and the entablature, on the contrary, was often made bigger and almost never smaller [10, p. 90]. In interwar Lviv each building had order proportions individually adjusted – in most cases entablature and pedestal height was decreased and the ratio of width and height of columns and pilasters, which is supposed to remain the same, was also changed. Besides, Lviv façades used universal means of architectural composition of classical façades such as symmetry, accentuating the main entrance with order, creation of clear meter with the help of order, the statics of form etc.

#### 4. CONCLUSIONS

Structural morphological analysis of order in Lviv architecture of interwar period helps study the specific features of order structure and its main characteristics.

1. Detailed analysis of order composition on Lviv facades of inter-war period shows that architects, while complying with the main rules of order structure, took the liberty of interpreting order and changing its proportions. Order was still used but was not canonic anymore. A morphological interpretation of order took place with change of proportions and adjustment to a specific situation and a specific building.
2. Proportional analysis shows the interconnection between order layout on a façade and the main methods of order proportioning. It has been established that order system is often part of one of the proportional schemes which were used at a certain period. It means that order is one of the main means for creating composition design of façades.
3. Modular analysis revealed the main ratios of order elements to module. It has been established that the ratio of column size to its diameter is often increased or decreased in comparison to Renaissance samples without any regularity.
4. Proportional analysis of order showed the ratio of entablature and pedestal height to the column. In general, on the façades of Lviv buildings classical proportions have not

been kept for the division between the main parts of order (12:3:4) – column: entablature: pedestal. In most cases, the height of entablature and pedestal was decreased as compared to the height of column.

5. In the course of comparative analysis it has been revealed that Lviv interwar buildings complied with the main rules of order construction – order is divided into three main parts: pedestal, column and entablature or into two parts in case of incomplete order – column and entablature. Yet, the division of the main order parts into smaller structural elements is not always preserved.

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