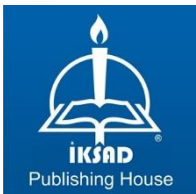


# Art of Architectural Form Making

Doç.Dr. Narmin AGHAYEVA  
Doç.Dr. Çiğdem BOĞENÇ

Editor: Prof.Dr. Banu BEKÇİ

2023



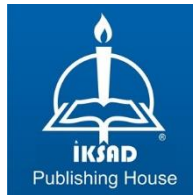
# **Art of Architectural Form Making**

**Doç. Dr. NARMİN AGHAYEVA**

**Doç. Dr. ÇİĞDEM BOGENÇ**

**Editör: Prof. Dr. Banu BEKÇİ**

DOI: <https://dx.doi.org/10.5281/zenodo.10276267>



Copyright © 2023 by iksad publishing house

All rights reserved. No part of this publication may be reproduced, distributed or transmitted in any form or by any means, including photocopying, recording or other electronic or mechanical methods, without the prior written permission of the publisher, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law.

Institution of Economic Development and Social Researches Publications®

(The Licence Number of Publicator: 2014/31220)

TURKEY TR: +90 342 606 06 75

USA: +1 631 685 0 853

E mail: [iksadyayinevi@gmail.com](mailto:iksadyayinevi@gmail.com)

[www.iksadyayinevi.com](http://www.iksadyayinevi.com)

It is responsibility of the author to abide by the publishing ethics rules. The first degree responsibility of the works in the book belongs to the authors.

Iksad Publications – 2023©

**ISBN: 978-625-367-451-9**

Cover Design: Çiğdem BOĞENÇ

December / 2023

Ankara / Türkiye

Size: 16x24cm

# CONTENTS

INTRODUCTION.....	1
1. COMPOSITIONAL ORGANIZATION of a FLAT FRONTAL SURFACE.....	3
2. METRORHYTHMIC SERIES IN COMPOSITION of ARCHITECTURAL FORM.....	12
3. CONSTRUCTION of THREE MAIN TYPES of COMPOSITIONS FROM PARALLELEPIPEDS.....	20
4. BUILDING of COMPOSITIONS FROM THE ELEMENTS WITH VARIED PROPERTIES.....	29
5. TRIDIMENSIONAL SPATIAL SHAPE DETECTION.....	33
6. COLORISTIC DEVELOPMENT of PLANE, VOLUME and SPACE.....	42
7. MUTUAL INTERACTION of STRUCTURE AND POLYCHROMY of ARCHITECTURAL FORMS.....	50
8. COORDINATION FORM THE VOLUME, IT ÍS INTERIOR, ENVIRONMENT.....	57
CONCLUSION.....	61
REFERENCES.....	62



## **INTRODUCTION**

Acquisition of the art of architectural form making cannot be limited by study of the central tenet of the theory of architectural composition and analysis of case in point of dramatic building and facilities. It is more successful with a well-balanced combination of theoretical and practical courses of the subject. Actually, it is necessary not only to know the definitions and classifications, types and characteristics of a composition, but also to learn to innovate, construct a three-dimensional spatial shape in a way that every time it represented an artistic-expressive system of subordinate elements. It is exactly the substantive practice work to acquire immeasurable value: ‘...an eye studies under hand’ – wrote the Russian physiologist Sechenov I.M. (1829-1905), developing an idea about motor apparatus of a human as a means of reliable perception of spatial relationships of real objects (Choice selection. M., 1947, p.343). For this reason, the defining role during deepening of the architectural composition course in the leading architectural schools is assigned to the practical way - definition and performance of a number of serial jobs.

The complex of hands-on exercises recommended in this textbook is oriented to development of spatial intelligence, which is necessary for professional training of the students, to acquisition of confident “power” over the architectural form, i.e. unfettered and on-stream choice of optimum alternative of its treatment. It is widely acknowledged that for these purposes it is convenient to use a combination of simple geometric elements. Such kind of structures are other than design models of particular buildings and facilities. They have only conventionality and generalized character, and allow to abstract from functional and structural requirements. However, at the same time to the contrary it is necessary to take into account the supposed nature of the composition being developed, in order to operate only with such forms, which can be realized as currently established tectonic systems.

The advantage of the layout method of performing the hands-on exercise over the graphical one involves the visibility of search for the composition of the architectural form in relation to its spatial altitude, possibility of its convenient inspection. Generalized characterization of the form in the nature of common shapes provides clearness of the clarity of perception of the visual features of the elements and terms of their collateral subordination. Moreover, the categories and regularity of architectural composition are not brought to light independently, but are synthesized and turned into aesthetically-figurative form. The conditional restrictions on use of any visual features applied in some practices determine the search of significance exactly on account of original geometrical arrangement of the geometrically defined and multiply seen forms.

The results of study of the methods of the composition practical course in different architectural schools and the teaching experience of the course of study allows to suggest cohesive set of exercises, which leads the students up to individual compositional art. The exercises interchange in such manner as to consequentially complicate the compositional tasks, increase the number of permitted expressive means and options of collateral subordination of the elements, to produce a shift to the more developed in the space structures, and plastic forming would be supplemented with the effect of polychromy.

Even though a model of architectural structure and architectural model differs with their assignment and form of accomplishment, in the explanations provided below for ease of reading the text the expressions ‘composition’, ‘model’, ‘maquette’ are conditionally considered as equivalent notions.

## 1. COMPOSITIONAL ORGANIZATION of A FLAT FRONTAL SURFACE

**Object:** insight into artistic regularities of organization of a flat surface by means of formation of compositional correlation of the simple geometrical shapes - rectangles.

**Tasks:** detection of engineered surface frontality; harmonization and accomplishment of cosubordination of the elements included in the composition; emphasis of the main part of structure under formation; orientation of composition towards audience (definition of above and below).

**Terms.** It is required to post some flat rectangles (up to 7-8) cut from stained single-colour paper on a sheet of white A4 size heavy paper. Aspect ratio of rectangles can be anywhere from 1:1 (square) to 1:10 (belt). It is fine to use rectangular loop, as well as overlap of the elements. The orientation of the rectangles must conform to primal coordinate axis given by side of the paper.

In the task No 1 it is necessary to achieve collateral subordination of rectangles based on the use of one or more symmetry lines.

In the task No 2 the coordination of the elements must be performed by virtue of visual balancing of a number of forms in an asymmetric composition.

**Explanations.** Around each element applied within limits of reference plane a conditional zone of its compositional influence is formed, the parameters of which depend on the properties of the involved element. It is necessary to articulate a reference plane by virtue of several rectangles such that their interacting conditional force fields formed in this respect overmastered the entire surface provided, therefore contributing its artistic integrity and giving rise to aesthetic experience at the audience. A distinctive feature of the first exercise is use of a limited number of visual properties of the elements involved, that is to say: dimensions of rectangles, their geometric view (by virtue of repropotion of their sides) and their position in space (within the limits of plane) with a focus on a search of a road of their compositional unity.

In the task No 1 the system of collaterally subordinated elements and hence their compositional unity is achieved by virtue of identical equation of rectangles placed on opposite sides of symmetry line. In this exercise different types of symmetry can be used: reflectional, centrally axial and diagonal symmetry. Position of pivotal element on a line of symmetry or figure axis lays emphasis on its significance, making the subordination of parts of the structure clearer and more expressive. However, symmetrical composition on a plane can be organized even without the main element in its center. In this case the imposed zone of the plane placed on the lines of symmetry and revealed by the intersecting compositional relationships of paired rectangles within its



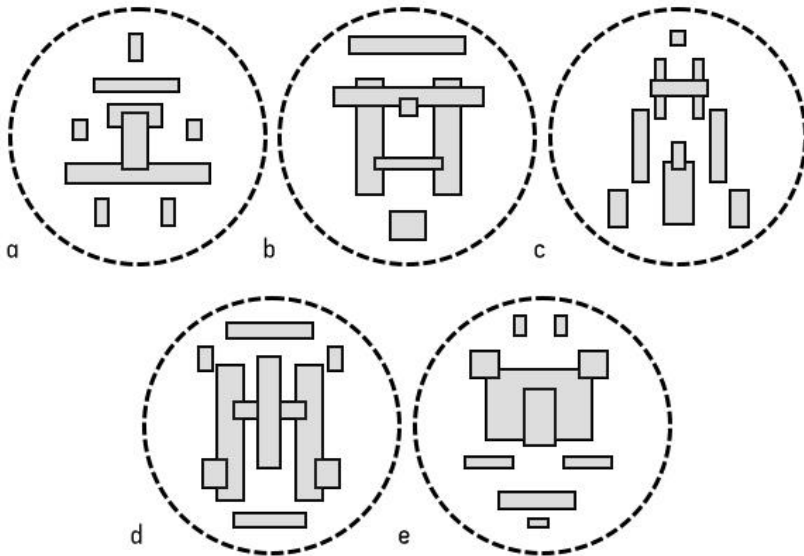
boundaries plays role of culmination point. Availability of common patterns in building of composition based on using symmetry, to no extent limits creative ability, and this provides support for some of below samples.

Three horizontally developed elements having different content function of the rectangle comprise the backbone of the composition, developed on the basis of reflectional symmetry (*pic. 1, a*). However, their organizing opportunities are not enough to overmaster all surface. In aid of them there are attracted some secondary elements placed on a plane peripherally, certainly in line with symmetry.

For the formation of culmination center of a composition in the midpart of the sheet there was placed a quite large rectangle.

In the work shown on *Pic. 1, b*, the original carcass of the future structure consists of two horizontal and two vertical elements.

For the purpose of expressive emphasizing its key point there was required to add a small-size square, partially laying it on the upper most lengthy rectangle. For the compositional organization of all the plane there were used two more rectangles; the difference between them by means of geometrical form as well as different properties of the two earlier involved horizontal elements highlighted bottom part (emphasized by a large squarish element) and upper part (emphasized by a narrow long rectangle) of the plane.



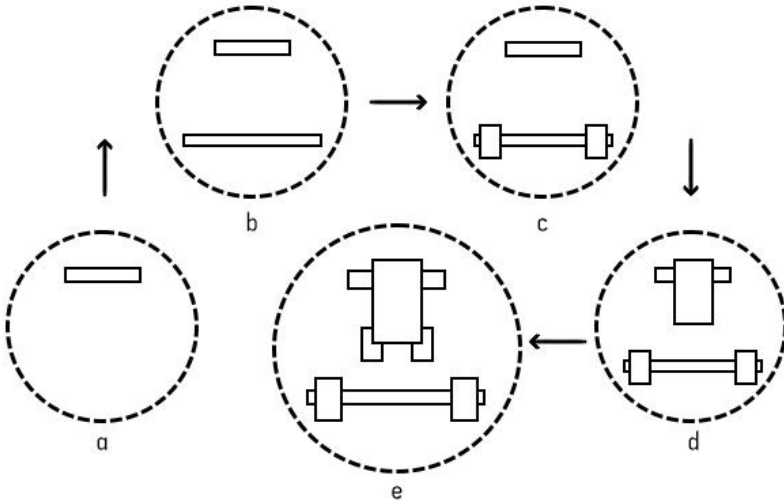
**Pic. 1.** Composition on a plane with the use of reflectional symmetry

The composition shown in *pic. 1, c*, is based off of pyramidal structure, generated by the two Just at that spot all metrorhythmic series of rectangles directed to the crest of the structure. In the point of their relative convergence a small-size square is placed, which significantly emphasizes a simple upper half of the composition. In over the range of the free bottom half of the sheet the large rectangle appeared. However, it did not become the compositional center: the exact location of the latest is stated with the help of additional small-size rectangle, partially laid on the large one.

The characteristic dense structure shown in *pic. 1, d*, is formed on the basis of three large rectangles oriented vertically. Once again, as in the work shown on *pic. 1, a*, it took some different geometrical type of not large elements, which circle in the massive main body and help it to overmaster all surface. The compositional center is emphasized by the virtue of additional horizontal rectangle, energetically connected all three vertical elements of the carcass.

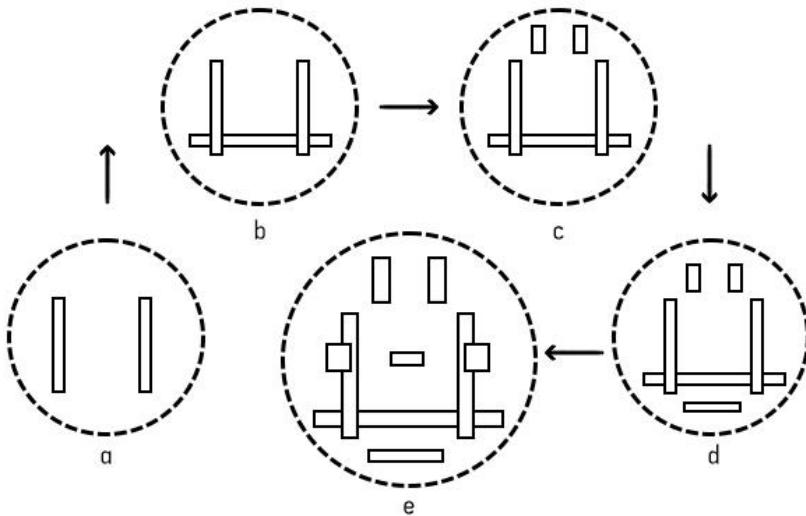
In the work shown in *pic. 1, e*, the place of the future compositional center was directly indicated with the extra large rectangle, placed in the midpart of the surface. Nevertheless, many other elements with different properties were required in order to support the large rectangle and compositionally organize the upper part, bottom part and flanks of the given plane. After that, it was necessary to specify the position of master node of the structure, which the additional element partially laid on the large rectangle was used for.

It is useful to trace the generation process of the composition starting with just clean break, when there is no formalized decision yet, and movement to the target goal passes on in steps (as it is shown in *pic. 2 and 3*). It is necessary to note that, the first 'step', i.e. visual properties of the isolated element (see *pic. 2, a*) or two rectangles (*pic. 3, a*) applied on a plane can vary greatly. The properties of the second inserted element (or group of elements) are partially predefined: they depend on the location and geometrical type of the already involved rectangle.



**Pic. 2.** The phases of building of a symmetrical composition on the plane

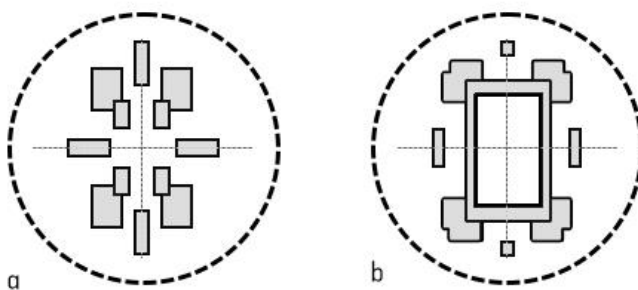
Thus, the new rectangle was placed in the bottom free part of the surface (see *pic. 2, b*) or as additional bridge between original components (*pic. 3, b*). It is evident that, the degree of freedom in the choice of the second ‘step’ is still great.



**Pic. 3.** The phases of building of a symmetrical composition on the plane

But the every further action on composition formation is increasingly based on previous ones. In the pic. 2, c, a couple of new rectangles was laid on the lower stem as on their previously prepared bridge. In *pic. 3, c*, the two newly involved components were placed in the free upper part of the sheet. Further there was required to start the formalization of the main part of the composition. In *pic. 2, d*, a large rectangle, the lower part of which determined the place of the future main body of the structure, appeared. In *pic. 3, d*, the midpart of the sheet, conversely, remained free, but in contradiction to a couple of the upper rectangles subjoined a stem in the bottom part of the surface. After that, it has been found, that in the work shown in *pic. 2, e*, it is necessary to support binding a focal point with two not large but active (because of partial cover strip) rectangles.

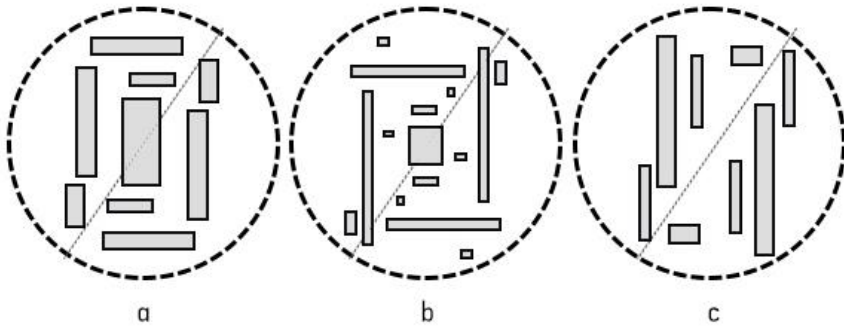
In *pic. 3, e*, the midpart of the sheet remained free was ultimately emphasized by a static element of very low dimension. In the works with the use of central rotational symmetry along with adoption each new rectangle it is necessary be specially careful, by virtue of the fact that hereupon automatically (as in a kaleidoscope) several elements identical to it appear, located on opposite sides of symmetry line. There can be two or more symmetry line. In the composition shown in *pic. 4, a*, axis order is two, and the angle of rotation was  $180^\circ$ . However, even with such small amount of convergency in the context of full pivot turn of the figure, the formed structure stands full of various elements, although here only three-four types of rectangles are used. Moreover, there is given an opportunity to build expressive rhythmic series of the elements, as though 'spreading out' from the midpart of the sheet. In this case there was no need to emphasize the compositional center by special rectangle. In the work in *pic. 4, b*, the main part is marked by virtue of decrease of amount of expressive means in the angles of the plane, and also introducing a centering frame and a rather massive rectangle laid on directly on the axis of symmetry.



**Pic. 4.** Compositions on the plane with the use of central rotational symmetry

The use of diagonal symmetry leads to quite flexible and expressive solutions. It allows receiving characteristic and varied points and a number of elements in different zones of the reference plane. In *pic.5,a*, it is shown that the rhythmic series of the rectangles are arranged by perimeter of the paper by way of transferring them and simultaneous revolution about an axis through  $180^\circ$ . No noticeable concentration of masses in the center appeared. In the *pic 5, b*, there is a concentration of rectangles in the angles of the plane; in the organization of its midpart the use of mass movement along the dissecting diagonal is noticeable.

In the work shown in *pic. 5, c*, the absence of elements located in the middle of the sheet draws attentions.

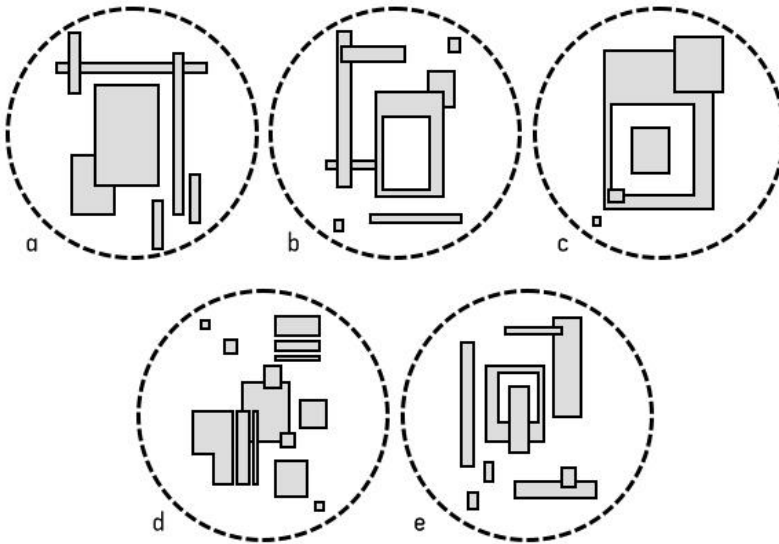


**Pic. 5.** Compositions on the plane with the use of diagonal symmetry

Asymmetric composition on the plane is the more complex and expressive system (task no. 2). As distinct from a symmetric one it does not impose neither the character of individual parts, no directions, which the number of elements can develop in. Such a composition is flexible allowing for the existence of various components, which determines the sharpness and dynamism of the composition.

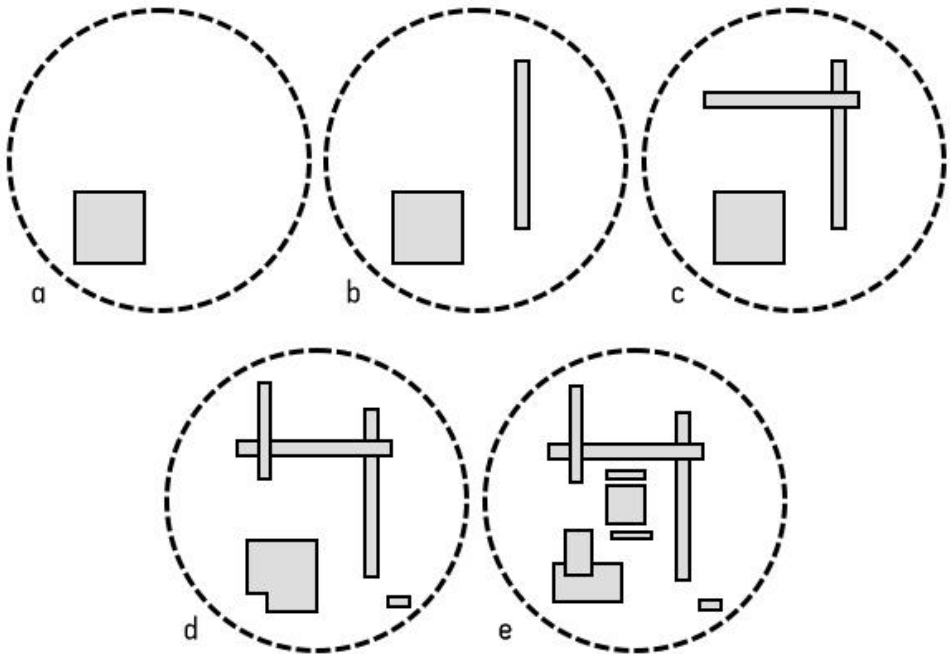
Special mention should go to the two categories of the theory of architectural composition, particularly topical while working on the task no.2. This is rhythm and contrast. Generally they determine the ‘subject’ of composition – a formal picture of it’s allocation. Thus, the composition on *pic. 6, a* is organized by the contrast of massive rectangle, representing the main part of the structure with series of small one-way elements at its periphery first; secondly – by rhythmic structure of several vertically-aligned rods, bounding the deviation of composition on the right and at the top and remaining the opposite (lower left-hand) angle of the plane under one more large rectangle (with partial cover strip). In the composition in *pic. 6, b* a rhythmic number of

different size rectangles appears arranged by diagonal of the sheet, which is opposed by a group of one-way elements structured in reference to the other diagonal. Compositional center, fixed by one of the rectangles, is additionally marked by a frame. It is necessary to note that the composition in *pic. 6, c* represents variation on the topic of preceding procedure with difference that the number of elements is decreased.



**Pic. 6.** Asymmetric compositions on a plane

The same conception of intersection of the spatial interdependencies of the rhythmic number of components is found in composition shown in *pic. 6, d*, here there is increased the number of series elements, a part of which is not presented by separate rectangles, but therefor is a rhythmic group of elements. Let's take heed that the compositional center is formed certainly and expressively exactly in the place of intersection of the complex rhythmic series. In the work shown in the *pic. 6, e*, the structure composed of rectangles lined up along the diagonal of a sheet stands out visually. The rhythm of the included in it elements is based on the determinate variations of their dimensions. The rectangle to fix the compositional center is additionally is emphasized by a frame and is bounded by rhythmized group of rectangles.

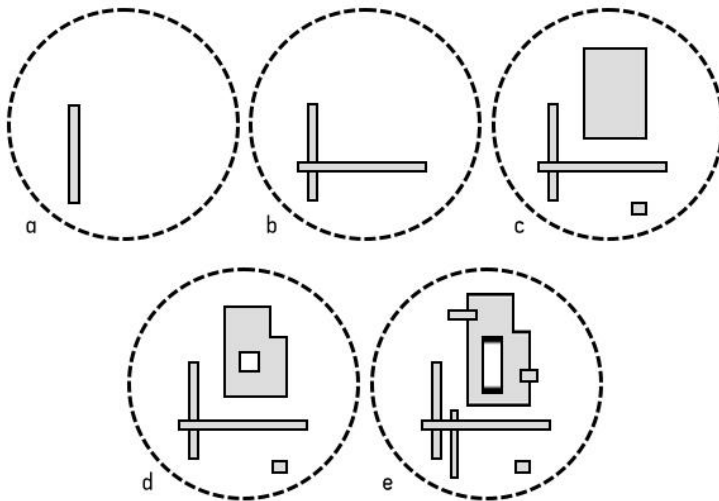


**Pic. 7.** Phases of building of an asymmetric composition on the plane

One of the outlined methodological approaches to the work on task no.2 can be specified. It consists in consequent introduction of new elements under regular monitoring of the proposed location of the deviation of the future composition. So, if the early formation of asymmetrical composition shown in *pic. 7, a*, was started with appearance of a large square in the corner of the sheet, then the second 'step' was done by virtue of bringing in the one-way element to the opposing edge of the plane (*pic. 7, b*), and the next step was aimed to bound the center of the sheet placing a new stem along top edge of the plane (*pic. 7, c*). As far as in this context the deviation of composition remained non-drawn around, in the upper left-hand corner of the sheet a vertical rectangle was added (*pic. 7, d*). Finally, in order to reveal the compositional center more definitely and expressively there was inserted an additional group of collaterally subordinated elements (*pic. 7, e*).

In an asymmetrical composition, more often than in a symmetrical one, solutions are found when the main element is located in the geometric center or in immediate vicinity to it – at the intersection of developed extensive association of partial components. The dimensions of the reference plane and expected scale of the composition suggest the extent of sheet split and the final phase of its saturation by the inserted elements. Thus, after several executed start actions on creation of asymmetric composition (*pic 8, a-c*) it became

necessary to reveal its main part (*pic. 8, d*), and then to add some more elements (*pic. 8, e*) in order to enrich the perimeter zones of the plane protecting the reached level of the center emphasis.



**Pic. 8.** Phases of building of asymmetric composition on the plane

While performing an exercise no.1 we often face the following mistakes:

- The number of rectangles is increased prohibitively, and they convert from expressive easy-to-read segmentations of the plane to the elements of its facture
- The plane of the assigned format is not fully used
- The compositional center under formation unreasonably depose from the midpart of the sheet or is reasonably lack of assignment facilities
- Sketchiness while grouping of elements of the left and right parts of reflectional symmetry, the similarity of dimensions of the rectangles and intervals between them in view of central and rotational and diagonal symmetry, strictly simplest variants of rhythmic order in asymmetric composition are allowed.



## 2. Metrorhythmic series in composition of architectural form

**Object:** the mastery of main principles of building of the metrorhythmic series of architectural elements as effective means of compositional organization of the three-dimensional spatial shape.

**Tasks:** development of the general and individual features of formation of architectural form of the three different categories - the plane, volume, and extension; learning skills of construction of the metric and rhythmic series of architectural elements, expectedly changing their visual features; provision of structural association of the parts of the three-dimensional configuration and achievement of its compositional unity.

**Terms.** It is required to build models of compositionally organized three-dimensional configuration forms: plane (task no. 1), volume (task no. 2) and limited extension (task no. 3). The tasks are performed with the help of simple and complex rhythmic series of architectural elements explicated in real extension. Single three-dimensional configurations can be used as similar elements as well as surface amplitudes or different segmentations of such kind of surfaces, possessing different visual features (excluding texture and colour).

When choosing the degree of the intervals between the involved elements it is necessary to use the regularity of combination of the unequal features of the three-dimensional spatial shapes and their regulations in accordance with all coordinates (as well as in accordance with depth while organization of the plane and volume). Dimensions of compositions: in task no.1 – from 30 to 60 m horizontally or vertically; in task no.2 – area – 20-40 m<sup>2</sup>, height – from 3 to 6 m; in task no 3 – the total area of organized limited extension of the interior type – from 200 to 600 m<sup>2</sup> with height of the applied elements till 8 m. The tasks are performed in maquettes made of white heavy paper on a scale of 1:100.

**Explanations.** Painterly unity of the organized plane (task no. 1) is effectively provided by regular alternation of the involved architectural elements and intervals between them. In the *pic. 9, a* an example of initial work on compositional organization of the plane is shown. The complex of several-sorted rectangles placed with different intervals is ‘interpreted’ as an integrated accomplishment organized in accordance with definite concept – a complex metric series that passes its properties to the organized plane. As usual on the further work stage there appears necessity for elimination of two long metric series inherent disadvantage: monotoneness and absence of the proper completeness of the shape, which its main part is not marked in. The plane shown in *pic. 9, b*, is more expressively articulated by the periods of the metric series; periods became more complex organized. With the purpose of visual delay of the lengthy metric series and emphasizing its main part, there is

accentuated the middle component of the composition that visually connects a large number of its vertical axes into stylistic harmony (*pic. 9, c*). The vague similarity of the developed composition with the facade structure of the notional object in this case were not a goal in itself; however it can help in understanding of the mechanism of the real project process, where the inner structure features of a facility is associated with its architectural artistic solutions and specifies it.

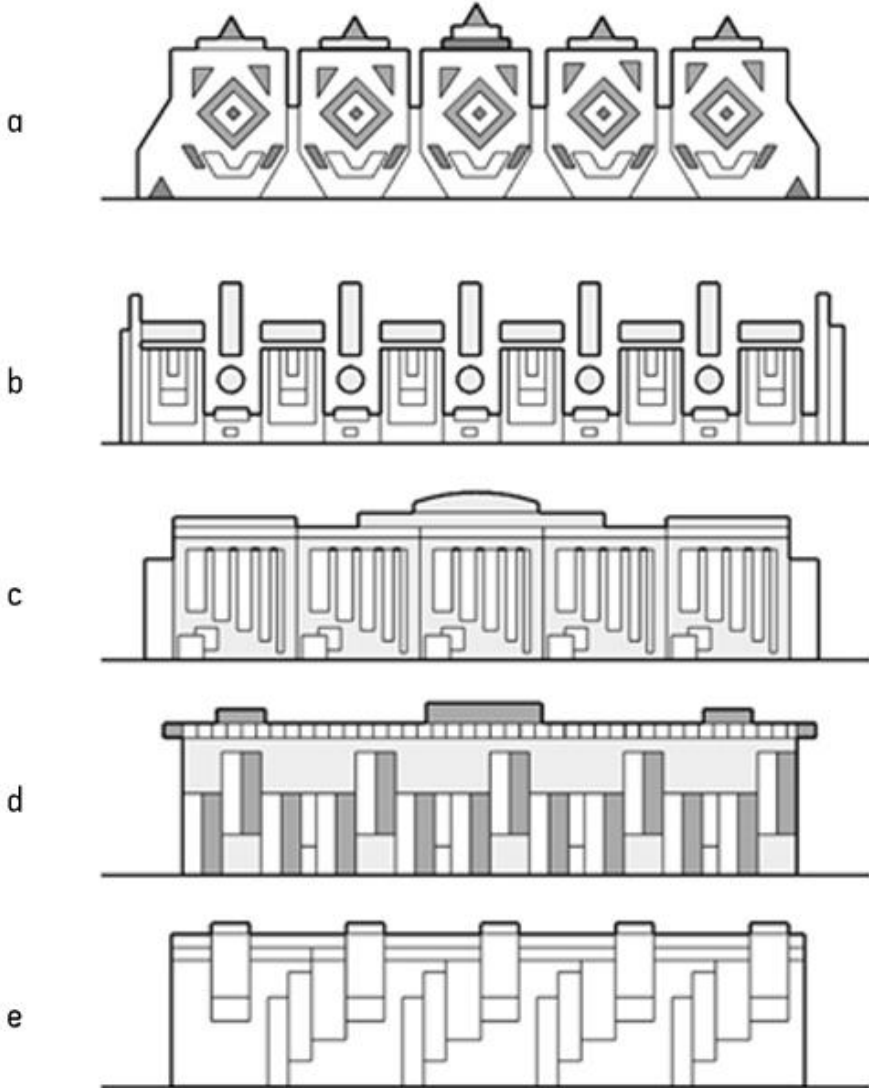
The pictures below show different variations of metric series construction and slope of enlightenment peculiar to them. The structure shown in *pic. 10, a*, consists of five sophisticated elements rich with individual internal rhythmic belts, which required an active emphasizing of its midpart (by complication of its silhouette). The principles of formation of the periods of complex metric series of the composition (see *pic. 10, b*) associated with availability of numerous small segmentations of the separate elements and the whole outline of the plane, specified by contrast the necessity of activation of its sides. In the work shown in *pic. 10, c*, where each element of the metric series is an actively directed rhythmic group of elements it became appropriate to mark the lines of plane symmetry.



**Pic. 9.** Organization of a surface with the use of metric series of flat elements

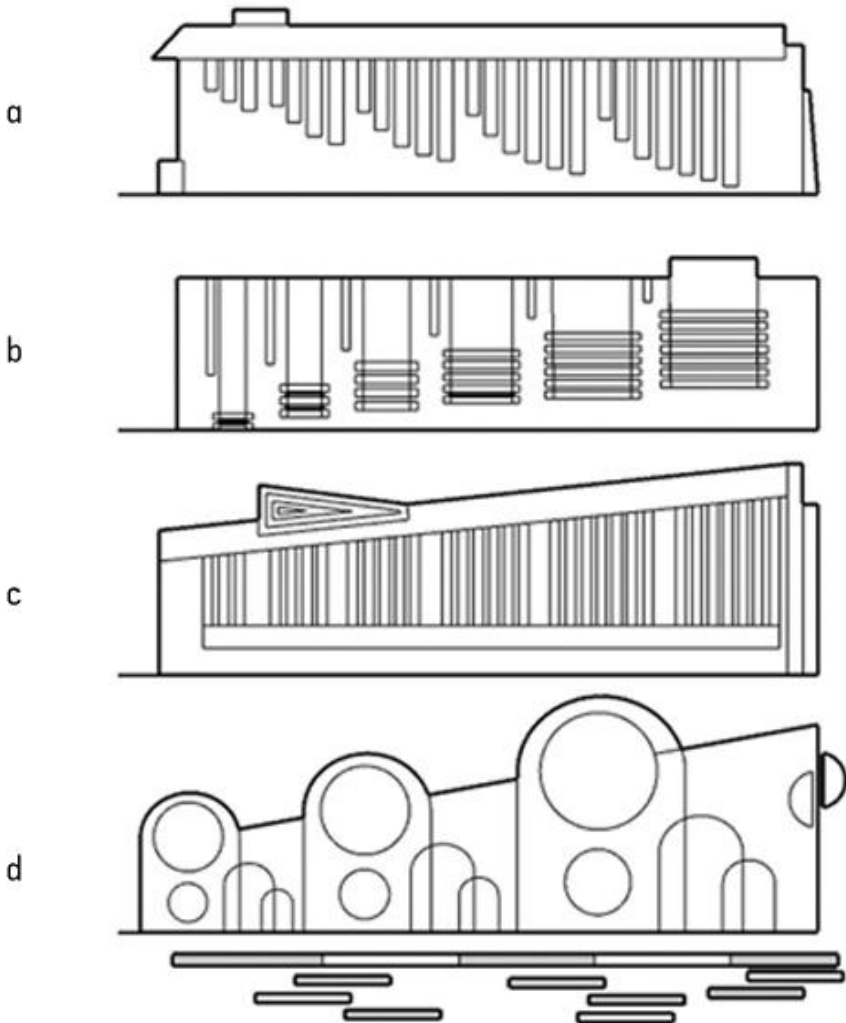
The work given in *pic. 10, d*, is an example of use of several stacked metric series characterized by rhythmic increase of elements of the series. By virtue of the fact that as the result their number was not so large in order to dismiss similarity of the structure it became necessary to increase the height of

not only middle element but some ‘shifts’ of the plane edges also. In the model shown in *pic. 10, e*, every period is formed by strong rhythmic movement of the relief plastic of the surface towards the audience and at the same time to the right edge; just at that spot on the right side an additional element driven by general dynamics of composition and fixing its culmination is placed.



**Pic. 10.** Organization of a surface with the use of metrorhythmic series of different elements

During organization of a plane with the use of none too lengthy rhythmic series within its range as usual an interfering repetition of the period do not appear as in metric series. But also here along with directly maintained attention to regularity in changing features of interchanging elements, additional efforts for visual 'break' of the series are required. The rhythmic changes of features of the composition fragments is easily revealed in the works shown in *pic. 11*: the number of vertical segmentations in each component increases (*pic. 11, a*), the number of horizontal girts on the rectangular loop projected from the plane the width of which also changes, increases (*pic. 11, b*); singly original cannelure per following higher alette is added (*pic. 11, c*), the number of flat elements with semicircular accomplishment and arranged according to height next to the plane as a part of shaped in it round embrasures increases (*pic. 11, d*). Unexceptionally any way of rhythmic series activation is used: disarrangement of the undisturbed horizontal silhouette of the plane on its sides (*pic. 11, a, b*), the slope of gross outline of the plane, application of additional dynamic trapeziform element on it (*pic. 11, c*) or arrangement of a large round aperture near it (*pic. 11, d*).



**Fig. 11.** Organization of the plane with the prior use of rhythmic order of the architectural elements

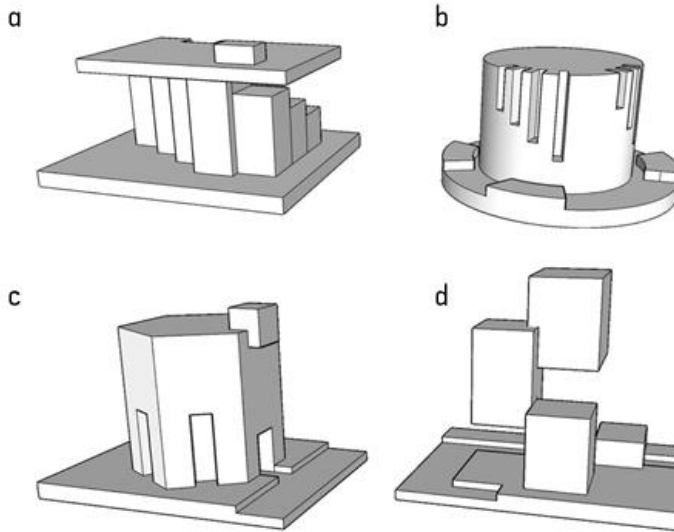
Organization of the volume (task no.2) can be carried out under two directions: rhythmic interconnections are constructed by means of segmentations of envelopes of the single geometrical configuration (prism, pyramidal solid, cylinder and etc.) or segmentations of the initial form to relatively individual component volumes. In any case the organization of volume supposes composition of metrorhythmic series of the distinguished

element on different borders of the initial form. In the *pic. 12, a*, this is shown by the example of rectangular prism: its profile plane are divided into consequentially increase the number of parts, combined into rhythmic groups. By all means, estimation of the rhythmical interconnections of the components of the volume under formation is possible only with circuiting of the audience around him (or model rotation), but not with shape perception from one point as it takes place in plane analysis.

When choosing cylinder as an initial form comprehension of rhythmic groups of the plane segmentation becomes easier, because quite a number of them simultaneously enter the viewing frame (*pic. 12, b*).

Perception of the capacity of the shape is also made easier with the use as an initial model of a polygonal prism (*pic. 12, c*), because it is seen from all around which regularity the character of segmentations change with while passing from one border to another. Moreover, it is wise to artistically emphasize that border or the separate area of the shape surface, where metrorhythmic series start to sweep from, by virtue of the fact that going around the volume they return here (the same way as there was necessary to activate the long metrorhythmic series on the plane). In the given examples a small cover strip over the upper plane of the parallelepiped (*pic. 12, a*), definite segmentations (blanking and cover strips) on the element of a covering of the cylinder (*pic. 12, b*), stepwise solution of the crowning of hexagonal prism (*pic. 12, c*) serve this purpose.

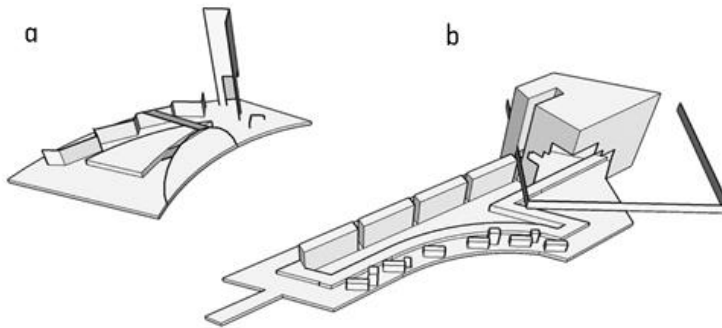
Under division of the initial form on relatively individually assumed volumes, it is necessary to determine according to which parameters their features are changed rhythmically. Thus, on the model shown in *pic. 12, d*, starting with small cube (partially buried on maquette foundation and is the point of reference of the rhythm) the mass of the following elements increases and the shift of them in space as if in spiral order takes place. Such kind of regulations in changing the features of the elements have to be shown to the audience in the process of circuiting about the volume.



**Pic. 12.** Organization of the volume with the use of metrorhythmic series of elements

The ways of space organization (task no.3) can also be conveniently classify into two groups: 1) opening of the metrorhythmic series of architectural elements with the help of segmentation on envelopes (foundation, profile plane, overlap); 2) segmentation of the very interior space with the help of the applied to it planes and volumes joined by the rhythmical interconnections in terms of some features. The conception in which segmentations of the surfaces serve as segmentations of the space at the same time turn out to be more expressive.

In the work shown in *pic. 13, a*, various artistic devices are used. It is as if dimensions of the space are drew around by the series of architectural elements which change expectedly starting with conventional entry into the space. They become larger; non-load-bearing reredoses and lanes between them (on the left), the width and height of the embrasures and pillars (on the right) become larger. The intricate shaped callouts of the overlap appear on larger heights. The space is actively getting narrow during the movement to the main part; it is emphasized by virtue of the elements with unusual properties: they have the maximum height and form peculiar discrete cell in the general interior space. Just at that spot, all metrorhythmic series reach their accomplishment, stop, and the space obtain orientation and compositional completeness.



**Pic. 13.** Organization of the restricted (interior) space with the use of metrohythmic series of architectural elements

The space shown in *pic. 13, b*, received envelopes separated by the rhythmically changing aperture of window and door, horizontal and inclined expanded belts, and also a system of segmentations supported on foundation.

This space does not get narrow, but extends as it goes to its main part, expressively emphasized by several structural components, which support a square frame in a plan, which is elevated above ground of the foundation. As a result heavy accent artistically convincingly ‘stops’ the expressed dynamism of the space, which provided it with the metrorhythmic series of the involved elements.



### 3. CONSTRUCTION of THREE MAIN TYPES of COMPOSITIONS FROM PARALLELEPIPEDS

**Object:** adoption of the main regularities of the composition of the spatial three-dimensional configuration shapes.

**Tasks:** study of criteria and conditions of formation of three dialectically interrelated types of a composition - front, volume and special; receiving all the necessary from each of three tasks of the composition types; provision of the unity of composition with cosubordination and consistency of surfaces, volumes and spaces; emphasizing the main part of composition; definition of the dynamics as visually perceptible movement from the borders of the shape to its compositional center.

**Terms.** It is necessary to construct a composition of each type. All the tasks are performed in maquettes by way of correct geometrical arrangement of several parallelepipeds. It is assumed to use parallelepipeds not fully bounded by planes (in the shape of frames and straightedges). Parallelepipeds should be oriented parallel to the main coordinate planes (conformed to the sides of the rectangular of the maquette foundation). The assumptions stated are conditioned by the need to focus attention on the search of the concise and expressive compositional interconnections of simple geometrical shapes. Their number and relative positions are determined by the composition type and author's approach. The material used for the maquettes is white heavy paper (in order to exclude the influence of such visual features as color and texture of the surface on compositional characteristics of the model).

It is necessary to well understand the dimensions of the future composition and the scale of its maquette, since this determines what kind of expressiveness of volumes and spaces needs to be achieved.

In the task no.1 it is required to construct a front composition in the shape of hard landscaping: the height - 2-5 m, front extent протяженность – up to 8 m, maquette scale - 1:50.

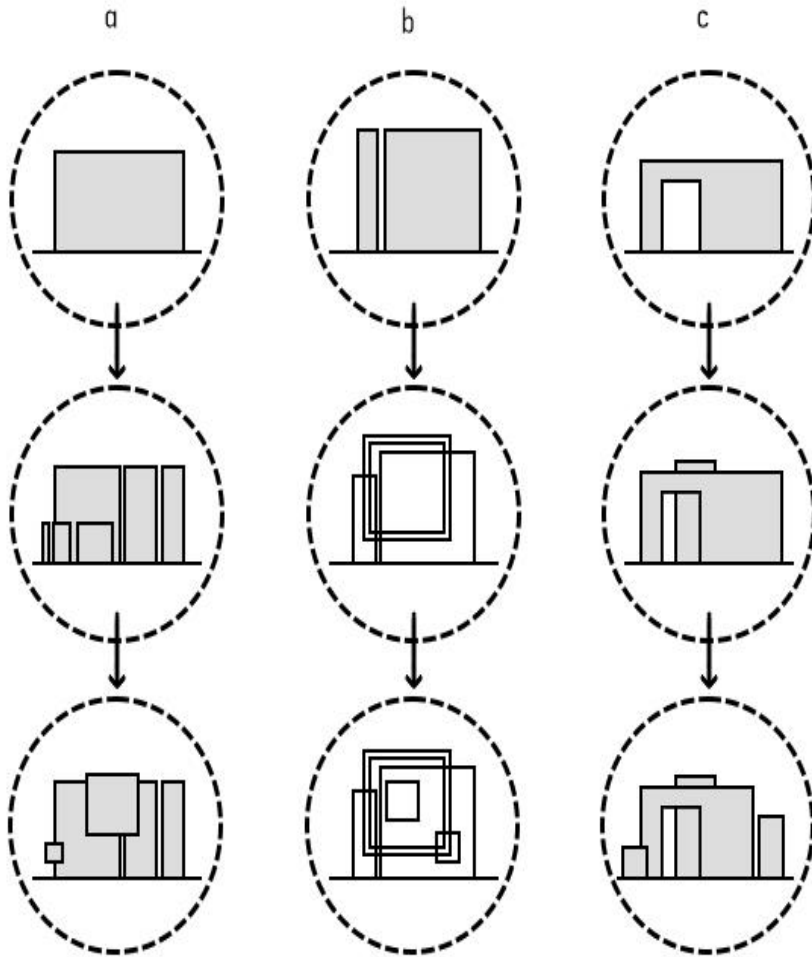
In the task no.2 it is required to construct a volume composition in the shape of separate object: height - 3-6 m, area - 4080 m<sup>2</sup>, maquette scale - 1:50.

In the task no.3 it is required to construct a spatial composition in the shape of interior type architectural space: the total area of the arranged space – from 600 to 900 m<sup>2</sup>, maquette scale - 1:100.

**Explanations.** To construct a composition means to incorporate several elements and to achieve formation of a system of their co-ordination with accomplishment of formal conditions of formation of a necessary type of composition.

The characteristics of the frontal composition is arrangement of its elements in compositional interconnection in respect to two frontal coordinates (vertical and horizontal); static location of the audience next to the shape; its orientation on the one main direction of perception.

The undivided flat surface located in front of the audience (*pic. 14, a*) despite its integrity cannot be considered as a composition, because the arrangement of such kind of a shape commonly answers its functional purpose and perception regularities (structural properties of the shape is missing). Therefore, the initial form was divided on three unequal parts, however even after this neither system of co-ordination no balance state appeared. Consequentially the other far lesser flat volume, which was simultaneously divided on three parts contributing in opposite direction, was placed in front of the largest and the heaviest element. The left flank of the formed complex of elements activated, the shape acquired the large balance state, but such kind of solution has not still provide the artistic unity of all the structure. The other arrangement of the parts of the former small volume let to form compositional center and develop a system of co-ordination of the attracted components.



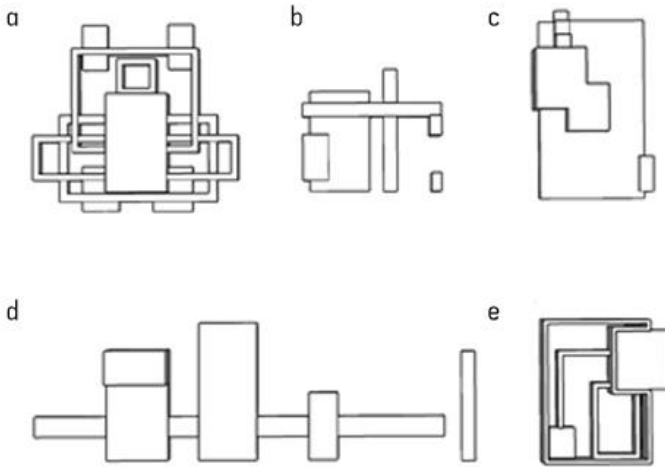
**Pic. 14.** Nascent stages of frontal composition

The example case as well as the following options of the composition construction (*pic. 14, b, c*) demonstrate important methodic point. The composition (of all three types) cannot be constructed simultaneously. It can be achieved only with realization of several methods. The first ‘step’ has a large degree of freedom; each following one is more and more contingent on the previous ones. All transformations are carried out, actually in reference to achievement of the compositional unity, which is considerably provided by emphasizing of the culmination center.

The initial phase of construction of the frontal composition illustrated in *pic. 14, b* is characterized by division of the reference plane into two unequal

parts. A square frame on the large element was applied and the height of the proximate one was decreased in order to emphasize the zone of the further compositional center. However, at the same time the main part of composition appeared to be represented insufficiently significantly; for this reason two squarish divisions were applied with the range of the base plane; one of them (large, prominent) increased significance of the compositional center. In the following example (*pic. 14, c*) the reference plane was enriched by large aperture. Near it the main part of the composition started to form: vertically emphasize fragment of the plane that was placed behind the aperture and with some shift. The composition of elements (including drawn apart in plan) with the clearly seen active features provided the emphasizing of the main part of composition, however it is short on secondary components for their expression, and they appeared right and left of the center, also being different but balanced by its visual features.

In the construction of symmetrical frontal composition, it is necessary to pay special attention to formation of the clearly seen change of the features of the elements in the left and right halves of the whole structure while movement towards its strong center, which usually leads to increase of the components number (*pic. 15, a*). Most commonly, the asymmetric compositions differ with large terseness, which at the same time does not decrease their originality. The difference in the properties of the elements placed to the right and left of the culmination center – thin and long vertical member and large massive volume, is used in the asymmetric composition in *pic. 15, b*. In the composition shown in *pic. 15, b*, the secondary elements are placed above and below the main part. In the work shown in *pic. 15, d*, the main element was highlighted, in addition to its greater height and middle position, by an actively bulging canopy. The composition given in *pic. 15, e* is characterized by development of the unostentatious rhythm of the narrow and wide inverted goal post and fixation of the master node in its midpart by static (squarish) element.



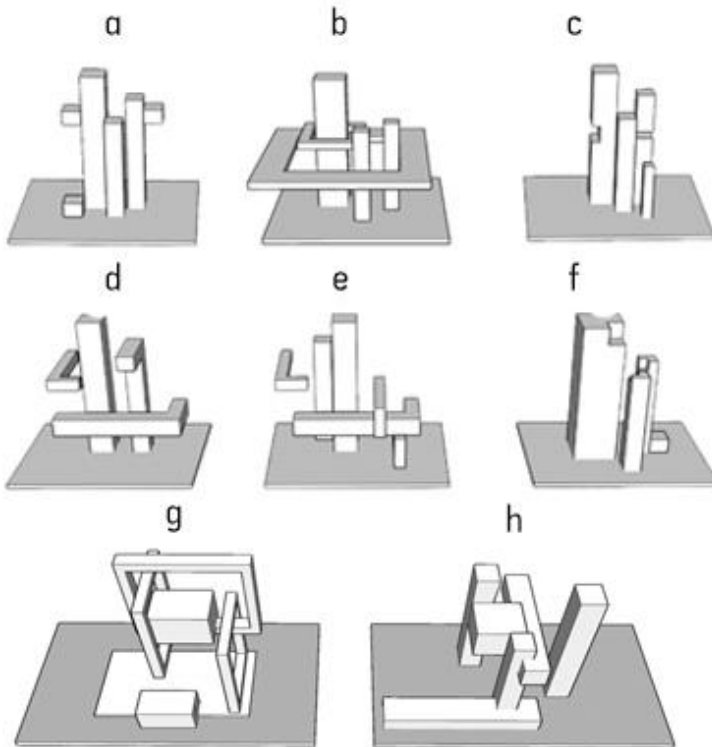
**Pic. 15.** Construction of frontal composition

A tridimensional composition is created based on perception mainly from all sides, although in specific cases it can be meant for vision from three or even two directions. One of the obvious examples of the tridimensional composition is shown in *pic. 16, a*. The architectural form consists of two clearly seen group of elements. The first group includes three deviations of different section drawing and height, arranged in the plan as around a circle and forming spiral rhythmmed order.

The second group of shapes - three cubes distinguished by their dimensions and place in the surface and creating the other rhythmic structure is applied for creation of a more contensive and expressive system of coordination of the elements of the composition. Two of the rhythmic series of shapes crosses over forming expectedly changing combinations of their visual features. Thus, the smallest cube is located uppermost on the highest and narrowest deviation, and conversely the largest cube is placed downmost on the shortest deviation, possessing the largest section drawing. The opposite combination of the changing features of the elements serves to balance state of the composition. A large squarish maquette foundation assumes great importance for the visual development of the shape in all three coordinates.

Setting of a group of vertical deviations on the peculiar basement in the middle of shelving base surface suggests the direction of the main perception and location of culmination center of composition (near large cube).

Most of the examples of construction of tridimensional composition shown in *pic 16* do not consist the large parallelepipeds with significant masses, but are determined as a system of deviation, frames and straightedges, which equally develops such a ‘dimensional volume’ (as space takes an active place in it) in accordance with all three coordinates. Rhythmic regularity in their elements properties change is a compositional motive joining the involved elements. On the model on *pic.16, b-e*, this function is performed by construction sites and frames changing dimensions and position in space; deviations and straightedges, variously oriented in horizontal and vertical planes; criplings with different section drawings and heights which have additional sub-system of blankings and cover strips. An extensive node in the point of concentration and intersection of the one-way elements located in the midpart of the formed structure is the man part of the indicated compositions.



**Pic. 16.** Construction of tridimensional composition

Among the examples of construction of a tridimensional composition, there is one that is characterized by involvement of the massive elements (*pic. 16, f*). However anyway for formation of a unique and expressive structure it was required to use the rhythmically changing dimensions of the components,

their location in space, and also small segmentations (in the form of fluting) in the angles of parallelepipeds. Certainly, the largest parallelepiped stopping the rhythmic series acts as culmination node. It is worth to note almost in all works the use of segmentations of base surface made in the form of stages, rampants and oriels. They got to be additional elements of the rhythmic order, proper point of reference while developing the system of elements co-ordination. Besides, it is the small segmentations of maquette foundation that helps to reveal the directions of the main approach to composition; optimal points of their viewing.

The works shown in *pic. 16, g-h*, expresses another approach to the choice of expressive features and compositional ways. Here the rhythmic order of the frames and deviations with different dimensions and variously placed in space is opposed to the large cubic form involved into structure. Because of the contrast of the mass this form gets strong compositional significance and appears to be able to visually coordinate the system of co-ordination of architectural form. Placed in the midpart of the structure it appears to be its compositional center.

Construction of the tridimensional composition is more complicated procedure in comparison with the work on the other types of compositions, because it is necessary to solve a large number of interdependent tasks, caused by the requirements of the clear perception of the space:

- 1) Reveal of the relative positions of the different shapes and their groups in the organized space;
- 2) Differentiation of distance between formed and subordinated spacing;
- 3) Setting of the regular well-balanced association of the elements and distance between them on the basis of rhythm and proportions;
- 4) Provision of unity and proportion of a composition;
- 5) Achievement of the clear orientation of all elements on the main ways of motions and main points of observation;
- 6) Reveal of the compositional focus, compositional center and compositional axes.

In order to construct a spatial composition it is necessary to place an optimal number of elements in the determined real space providing co-ordination between both inserted components and various zones of the created space. The methodically correctly constructed and artistic-expressive spatial composition is generally based on interrelation of several rhythmic series of the architectural forms with determinate variations of their visual features. Such kind of term is also currently topical for construction of the other types compositions, but the abundance by it in the given task is complicated by the fact

that in vast area () it is harder to achieve the accurately perceptible system of co-ordination of the elements isolated from each other. The given examples demonstrate the search of such kind compositional extensive interrelations in different variations.

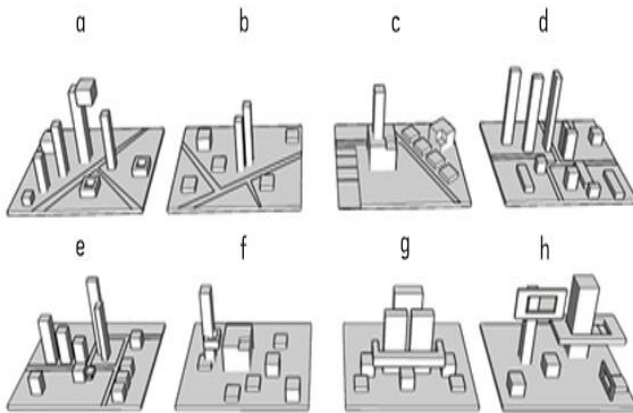
The work shown in *pic. 17, a* is constructed on combination and more specifically at the intersection of three rhythmic groups placed on the maquette foundation of the elements. The chain of verticals is formed of the parallelepipeds which intensifies in section and heightwise as it goes to the compositional center. A row of the identical flat squares is oriented on the other coordinate axis. Finally, a belt of the flat squares similar in size but with shallow dredging, extended along the third compositional axis parallel to the verticals series. In the result, a point of rhythmic series concentration turned out to be a fragment of space characteristic by its features. It should be emphasized: it is not a point of their intersection marked by something, but it is exactly the zone where the chains of different elements intertwine. In this case, the conventional triangle of the compositional center is marked by the highest parallelepiped (dominant), flat square and additional vertical accent. Such a compositional principle is differently leaded in the other examples with another amount of various elements and ways of their rhythmization.

In the composition shown in *pic. 17, b*, the rhythmized complex of the elements includes two chains of flat squares: one of them is built on metrical arrangement, and the other one is built on rhythmical one. A compositional center is formed in that part where the masses are concentrated, where the squares of different rows are next to each other, and where three additional vertical volumes (a group dominant) of different height are placed. In the composition on *pic. 17, c*, the space is divided on two inter-perpendicular compositional axes. Each axis is fixed by the rhythmic series of cub volumes, but in one series, their size changes expectedly, and in the other series, the intervals between them do. The intersection of metrorhythmical series is organized peculiarly: different-sized cubic volumes placed as around a circle and the vertical added to them fixes the location of the compositional center. Small blankings of the mass performed in different angles of cubic volumes as well as near the foundation of the vertical play considerable role in reveal of corkscrewing from the common elements to the dominant.

In the composition in *pic. 17, d* even four intersecting rhythmic series of the architectural forms represented by straightedges, deviations and parallelepipeds were constructed. The placement of the volumes is coordinated with the help of two inter-perpendicular compositional axes; and the compositional center emphasized by components concentration and also by inserting of the strongest vertical accent belonging to none of the rhythmical series, is formed near the T-shaped intersection of axes. The work shown in *pic. 17, e* is based on the ultimately similar compositional technique of



segmentation of the space by the rhythmic series of the solid elements and visual axes. However here the intersection of compositional axes (vane-like) is determined in different way; in this intersection the compositional dominant looks very natural and expressive in the shape of coupled verticals. The location of the compositional center is marked additionally by fluting in the base surface. The peculiarity of the work shown in *pic. 17, f* involves the arrangement of elements of the rhythmic series, which splits the space and leads up to its main part, not end long of rectilinear axis, but along spiral trajectory.



**Pic. 17.** Construction of spatial composition

In the *pic.17, g*, an example of building of the symmetrical spatial composition is given. In such a situation, it is very important that right and left groups of the elements are connected by their inner rhythmic regularities in the change of the features of the architectural forms. In the given work the main strong compositional axis is supplemented by two secondary parallel axes. Different levels of base surface, as well as flat elements stilted above them and spanning the space are used in segmentation of the formed lengthy central-axial space. The flat frames even more heavily lifted slightly above the maquette foundation are used in a composition in *pic. 17, h*. They create their individual rhythmic series, which alongside with the series of the other components (cubes, vertical deviations) splits the space and leads up to its main part, marked by the smallest cube and the largest frame placed on the large deviation on the greatest height. It is necessary to emphasize here the increased role of base surface segmentation: its stages expressively lead up to the site of the compositional center lifted on the relief.

#### 4. BUILDING of COMPOSITIONS FROM THE ELEMENTS WITH VARIED PROPERTIES

**Object:** assignment of concept of the vital differences and general regulations of building the compositions of three dialectically interdependent types, the further review of the visual features of architectural elements.

**Tasks:** regulation of properties of the component elements; formation of their co-ordination system; emphasizing of main part of the composition; support of solidity and harmony of the architectural form in the context of possible use of the extensive tapestry of expressive means.

**Terms.** It is necessary to build one composition of each type in a maquette – frontal, tridimensional and spatial one. The difference from the task no.3 is that here the set before restrictions in use of the visual features of the involved elements are eliminated. However, the general compositional requirements of structural properties, integrity and harmony of the tridimensional spatial shape, compositional types representatives remains. It is necessary to provide the correct choice of the shape proportion, observing is relative parameters within the shown below range.

In the task no. 1 for building of a frontal composition as a small architectural form: height - 2-5 m, frontage – up to 8 m; maquette scale - 1:50.

In the task no. 2 for the building of a tridimensional composition as a separate object: height - 3-6 m, square area - 40-80 m<sup>2</sup>; maquette scale - 1:50.

In the task no. 3 for the building of a special composition as exterior type unrestricted nonclosed architectural space: total square area – from 600 up to 1000 m<sup>2</sup>; maquette scale 1:500.

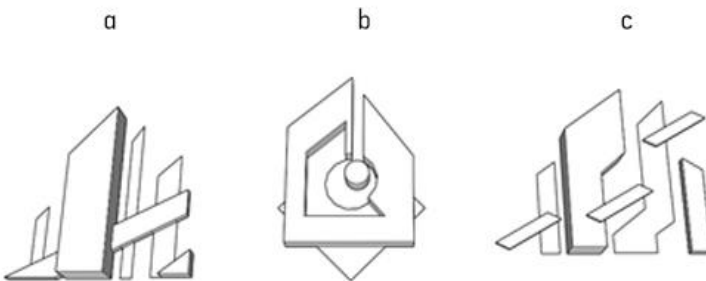
The elements of composition can be of different geometric shape and be freely oriented towards the main coordinate axes; they can be separated by a distance, slam into or adjoin to each other. Figurative development of the elements surface in the special composition is allowed. The number of elements and their relative position is determined by the type of composition as well as the author's preferences. The material for the maquette is white heavy paper.

**Explanations.** Potential for use of various geometric shapes anyhow oriented in space certainly not simplify the process of formation of a composition as it can be understood. Availability of essential requirements of the structuredness and integrity of architectural form specifies constant self-limitation in the choice of expressive means so that their abundance does not lead to weakening and destruction of compositional spatial connections. Thus, the frontal composition shown in *pic. 18, a*, is ultimately built of parallelepipeds. However, it was enhanced by transformation of all primary

elements that got unorthogonal borders (especially, shoer end faces). Under such kind of conditions, right triangle play a good role of the main element of the composition: its sides directly fed in to the formed system of set of coordinate axes - vertical, horizontal and oblique.

A small number of elements that differ from the usual squared shapes by the other counter drawing of some (unorthogonal) borders, are also involved into the composition in *pic. 18, b*. However, in a sign of them some shapes formed by bent surfaces separates out the main part of the generally concise structure very well. The outlines of elements of the composition shown in *pic.18, c* are elaborated more complexly. All of them are under the control of the singe system of coordinate axes (vertical and oblique), that provided the completeness and harmony of the formed structure. One more characteristic feature of this work lies in characterization of the culmination node: not a solid element but broken out aperture between planes is located on its place.

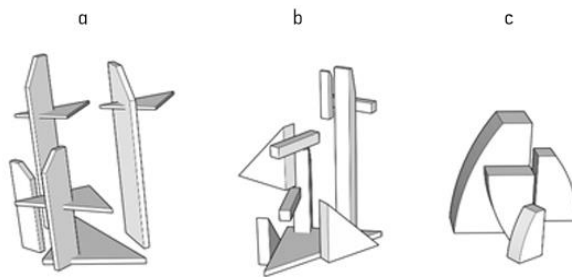
In the tridimensional compositions, the choice of involved geometric shapes is wide: they can be the same parallelepipeds, as well as prisms and pyramids, fans and full-spheres. Thus, in the work shown in *pic. 19, a*, structural elements are the shapes formed mainly by parallel-perpendicular planes, but not all angles between them are right. The main subject of composition – is rhythmical alternance of criplings of different height, as well as splitting and at the same time joining them horizontal panels. The compositional center is oriented on direction of the main perception and is forming in the lower part of the structure, where the largest elements interact and the reading of the rhythmic series starts.



**Pic.18.** Frontal composition building

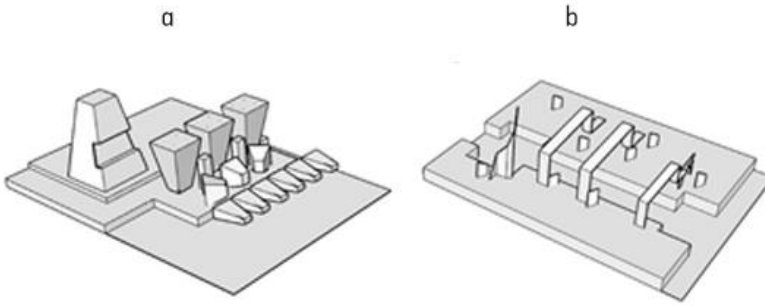
Set of components in the composition shown in *pic. 19, b*, also does not run the gamut with regard to their geometric shape: here variously space-oriented linear and plane shapes interrelate. The unifying foundation is rhythmic order in their placement – movement from the concentration of the

elements in the lower part of the pyramid structure to its more exhausted upper part. The inclined character of outline of the horizontal shapes for sure makes the composition unique in comparison with those built based on parallelepipeds. The composition shown in *pic. 19, c*, demonstrates the example of use of more complex stereometrical shapes restricted both with straight and curvilinear surfaces. Taking into consideration these circumstances a limited number of elements is included in the structure. The rhythmic change of their visual properties (size, the position in space, the radius of curvature of the surface) observed by the audience while circumambulation of the shape provides construction of tridimensional composition in particular.



**Pic. 19.** Tridimensional composition building

In accordance with the terms of task no. 3 the free geometric shapes have to be used for building of exterior-type tridimensional composition, which has quite large square area of the base. In the methodic plan it is possible to perform the work in two ways. The first variant includes placement of quite self dependent objects restricted by the planes from each side on a maquette foundation. Thus, in the composition on *pic. 20, a*, the space is divided in depth on several plans fixed by the series of separate elements complex by their geometric type. Due to the approach to the compositional center the number of shapes in series decreases, their dimensions increase, and the geometric type changes. As a result, a definite sketchiness of compositional solution, which would be possible in terms of performing the task no. 3 in the context of coordination of parallelepipeds, is observed here by the virtue of variety of the involved elements.



**Pic. 20.** Spatial composition building

The second variant of performing the task no. 3 is defined by the fact that the shapes involved into the space are not restricted from all sides. Such kind of method allows to concentrate on formation of the complex rhythmic series, the elements of which are more expressive by their plasticity. In the composition shown in *pic. 20, b*, the placement of several similar by their configuration groups of the plane elements along the straight compositional axis refer the audience to the dominant object providing an interest to the chosen method of space organization.

## 5. TRIDIMENSIONAL SPATIAL SHAPE DETECTION

**Object:** the further study of the visual means of architectural elements, acquisition of the methods, features and regularities of formation of three types compositions, development of concepts of figurative design of tridimensional spatial shapes.

**Tasks:** acquisition of the methods of architectural form reveal; support of stylistical harmony of the used features of figurative development of the involved surfaces and volumes; regulation of the features of separate component elements; formation of co-ordination system both of the method of figurative development and separate component elements; emphasizing of the main part of composition and accomplishment of its completeness.

**Terms.** For provision of methodically clear performing of the given exercise each student conditionally choose the initial architectural form. In the task no. 1 – this is unsegmented frontal plane, in the task no. 2 - single volume of different geometric shape (parallelepiped, cylinder, prism, fan, pyramid), in the task no.3 – non-organized part of the real space. In order to reveal the chosen architectural forms it is required to split them, to destroy their initial integrity, to bring the newly formed cooperating elements and tools of figurative development into the system, observing main features of compositions of the definite types. As a result, it is necessary to get more expressive tridimensional spatial shape, awaking strong emotional aesthetic experience.

It is required to perform three tasks. In the task no.1 it is necessary to reveal the chosen flat frontal surface. Its dimensions heightwise and edgewise are from 10 up to 25 m; the reference of the length by frontage to the height is in an amount of 1:2 to 2:1. The surface is placed on the horizontal plane of the base frontally relative to the audience. The task should demonstrate achievement of interrelation of the formed fragments of the surface and the total solidity of the surface based on combination of properties of the architectural elements by the method of simultaneously subordinated segmentations. It is necessary to check up on the plane proportion, which depends on interrelation of dimensions of segmentations and height of a relief.

In the task no.2 it is necessary to reveal the chosen volume which is observed from all the sides at a human height. The highest volume in regards to height or in a plan is up to 15 m. Segmentations of the volume surface can be absolute or non-absolute, pass-through or light. It is required to achieve interrelations of the adjacent sides and total solid volume emphasizing the regulative interrelations of the visual means of the elements. It is necessary to pay attention on balance state of the masses and space in the volume, to check up on proportion generation, to determine more favourable location of the audience in regards to the volume (in the plan and heightwise).

In the task no.3 it is necessary to reveal the chosen open space. The total square area of the organized space, which the volume shapes are placed on is up to 1.5 thousand m<sup>2</sup>; aspect ratio of the square area is from 1:1 to 1:4; the maximum height of the shapes involved into space is up to 30 m. It is required to reveal the orientation of the space to its compositionally dominant part and achieve the completeness of all special complex.

The facilities of compositional tasks solution: vertical and horizontal segmentations, relief and concave relief forms; contrasting, detailed, proportional relations of the element properties and their marked segmentations, metric and rhythmic series; correlation of tridimensional spatial shapes with various features – geometric type, dimension, position in the space, mass, effects of light and shade (colour and texture excluded); division of the space edgewise and in depth, method of foreshorten, surface relief of the base (in task no.3 and partially in task no.2).

The works are performed in maquettes from white heavy paper. The maquette scale in the task no. 1 and no. 2 is 1:100, in the task no. 3 - 1:200. On the maquette foundation a human figure is placed.

**Explanations.** For supporting the unity of the form it is consequent to use the limited amount of the expressive means, similar segmentation ways of volume and space surface, clearly ‘understood’ rhythmic regularities in the change of visual features of the visual elements. The search of concise key point is required in segmentation of the shape.

Surface reveal. In the *pic. 21, a*, (at the left) there is shown the initial conventional surface used as a basis for the further surface reveal. The following means are used for solution of the set compositional task: first, vertical segmentations separating the surface into several narrow stripes differing with yawing in a plan; secondly, series of light sections accomplished on vertical subdivisions and forming rhythmic groups of elements, varying in magnitude and position in space (within the range of sections the position of the restricting planes is changed by rotation in their plan); thirdly, the rhythmic series of the extending stripes – sections, which is stopped by the special element placed on the base of surface at the fore. As a result, a completely new, more expressive compositionally organized plane was obtained.

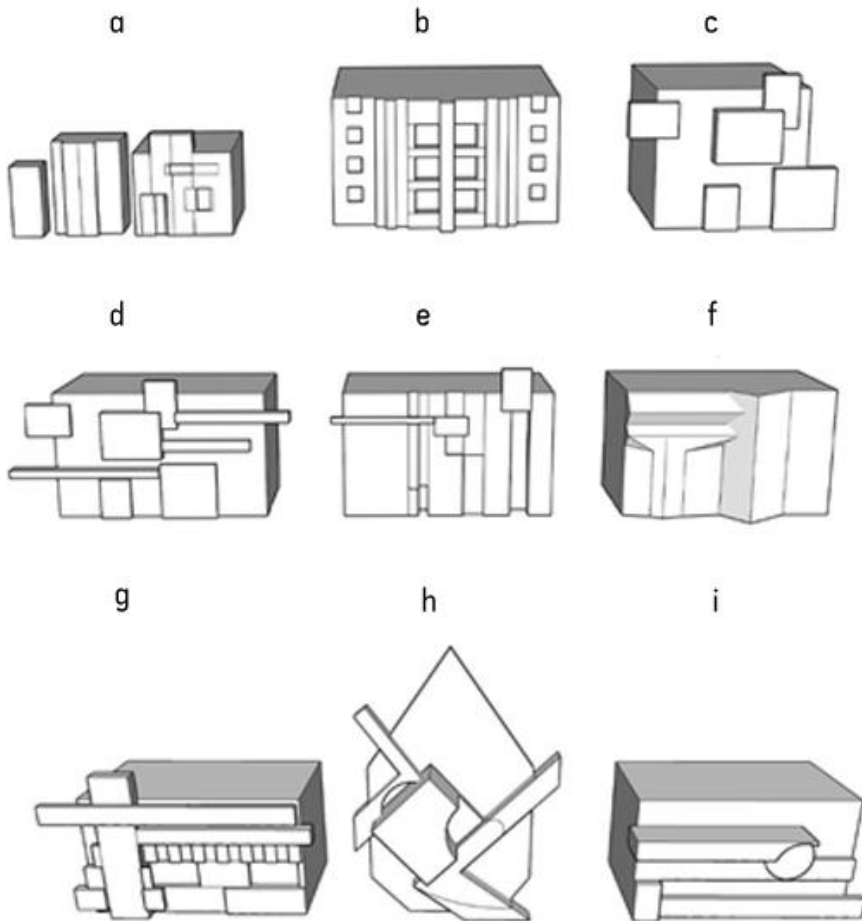
In the symmetric composition in *pic. 21, b*, the intersecting rhythmic series of vertical and horizontal segmentations of the surface are used. The first ones are formed by the full height stretched folds of the wall plain, and the second ones are executed as fragments of the deformed surface in the plan. In the composition in *pic. 21, c*, the low level surface relief is applied, forming several squares collaterally subordinated in size and position; the main, central, the largest and the most taken to the audience one is a cut above. In the work in

*pic. 21, d*, on the flat rectangular surface some fragments of bent surfaces are placed which also provide rhythmic order, because they regularly differ with their position (settling down and shifting toward), size of the sides and surface curvature. Compositional interrelation of these subdivisions is visually supported by horizontal bands of different width and length. On totality of visual features the main element is allocated in the lower part of the wall. In the composition in *pic. 21, e*, the plane is separated by the faceted vertical flutings regularly changing the width, height, mutual position of the borders. The completeness and balance state of the detected plane is supported by integration of the horizontal cornice in the right place (on the left flank of the free field), which actively standing against the extensive vertical channels, and emphasizing of the culmination node by a pair of additional components (also faceted).

In a number of works more complicated system of co-ordination of the surface segmentations and elements of the shape is used. Thus, in composition in *pic. 21, f*, the relief of the frontage plane is organized by the way of combination of the rhythmized fragments of the bevel faces, differently space-stabilized, among which the main part is emphasized by its large dimensions. In composition in *pic. 21, g*, there is applied a combination of several simple metric series placed one above the other, where the vertical ribs of the intersecting bent surfaces of the different radius serve as the elements of the series. Among the numerous components having geometrically similar form, the main large high fragment of cylindrical surface is emphasized, which is necessary for the visual stand of metric series.

The work given in *pic. 21, h*, demonstrates the example of use in organization of its large segmentations plane provided with offsets and valleys having rectilinear and curved lines. The complex system of segmentations conforms here to two groups of coordinate axes: inclined mutual perpendicular and concentric ones. Compositional node is formed in the mid part of the structure where the elements with active visual means are concentrated superimposing on one another. In the work shown in *pic. 21, i*, there are used the intermittent series of the differently inclined fragments of the surfaces, and for emphasizing the main part among the abundance of horizontal and vertical segmentations the only flat cylinder is used.





**Pic. 21.** Surface reveal

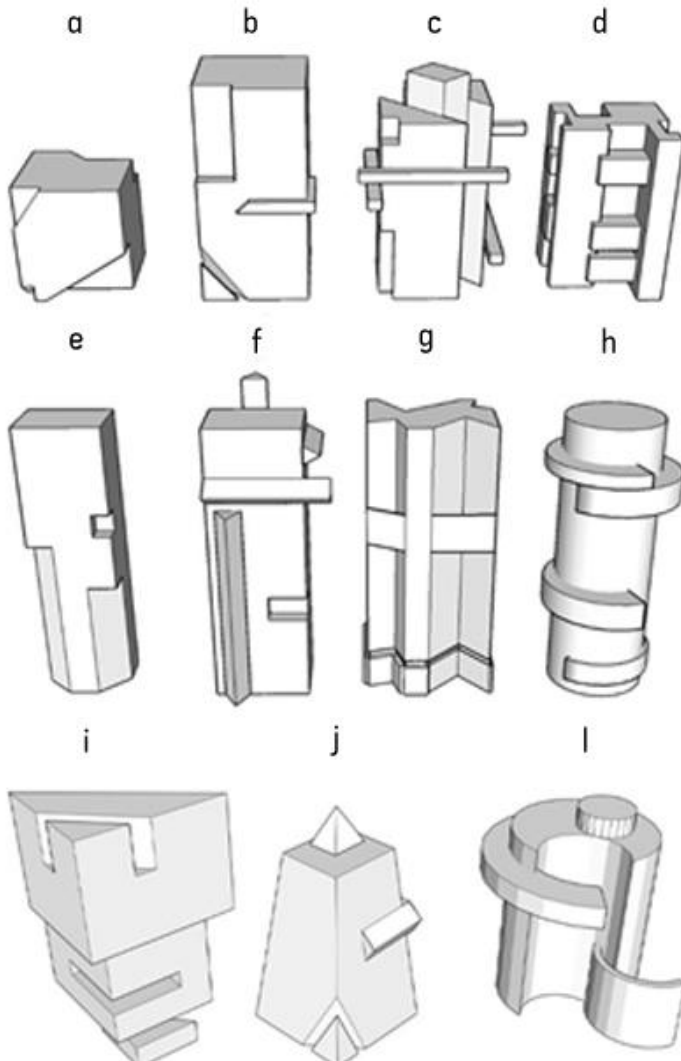
**Volume reveal.** The difference between examples of work to identify volume lies primarily in what volumetric form is used as the initial one. Thus, the composition in *pic. 22, a* shows the large compositional opportunities to be opened in the process of reveal of the cube – seemingly static, inert shape. However, as a result of only a few volume segmentations performed by the oriented cut plane in a definite way, the cube acquires rather different degree of expressiveness keeping the visual completeness. In the compositions shown in *pic. 22, b-e*, the base form is a vertically emphasized parallelepiped. Various expressive means takes place in reveal of the volume, among which some specific one commonly prevail: segmentation of parallelepiped of the oblique surface (*pic. 22, b*) or vertical one (*pic. 22, c*); splits of the mass in the form of wide vertical stripes (*pic. 22, d*); withdrawal of volume part cut out by the

cutting planes (*pic. 22, e*); usage of additional laid over the parallelepiped elements, which emphasize the section drawing of its plan as cornices (*pic. 22, b-d*).

Comparison of the two compositions shown in *pic. 22, f, g*, shows the different approach to reveal of the vertically emphasized shapes. In the first composition performed on the basis of trihedral prism the additional overhead elements are also introduced, also of triangular cross-section, oriented in different ways; they also reveal the plan of the main shape and its vertical dynamics. In the second composition performed on the basis of polygonal prism there are used vertical rhythmic segmentations of the shape expectedly differing by interpretation of faceted belts of different widths. The listed expressive means are used in composition on reveal of the cylinder volume in small numbers (*pic. 22, h*). Cylinder stilted above the basis (by virtue of secondary element) is separated by series of bounding it cornices of different dimensions and placed at different height, and also by a set of vertical gains and cover strips, sweeping on the surface of the cylinder as an additional rhythmic series.

In the composition performed on the basis of triangular prism (*pic. 22, i*) the initial volume is divided in height into large parts with an increase in mass upward.

Besides, differently oriented, varying in size cutouts were used in the accumulated layer. The composition shown in *pic. 22, j*, demonstrates the reveal of pyramidal volume; at this time, the contrast of the masses of the upper and lower part of the shape turns out to be an effective expressive property means. This volume was complemented only by a few cutouts and overlays. In the work in *pic. 22, k*, the cylinder underwent major deformation by means of cut-off of some of its part, separation of the main mass from the base, restoring the balance of the volume with additional curvilinear elements. In all the works the direction of the main optimal perception of the form is emphasized by concentration of the elements with more active visual means on its certain side.



**Pic. 22.** Volume reveal

Space reveal. As compared to the task on space building (task no 4), where it was required to compositionally incorporate the separate volume shapes placed on the fixed area, in the task on reveal of the space it is necessary to strengthen the expressiveness of a conventionally defined fragment of space, already emphasized in the general real space. With this aim there are used such specific architectural means as subdivision of the fixed space and segmentation of the involved volumes and restricting surfaces. Here division of the architectural space is achieved not only and not so much by integration of the

individual tridimensional shapes as construction of the planes, restricting and splitting the conditionally fixed space on collaterally subordinated parts. As well as in the tasks on reveal of the plane and volume, it is also important to determine the main compositional principle of spatial shape segmentation, that do not excludes the existence of several groups of the rhythimized elements.

In the work shown in *pic. 23, a*, the boundaries of the space boundaries are fixed by simple means. The fragments of the flat surfaces placed on the right flank of the structure are oriented parallel to the main compositional axis, and perpendicularly on the left flank. Both for a total clearly differentiate the space in depth. The compositional center is formed on far-distance view in front of the largest flat component, stilted above the foundation and allowing the space 'to flow' under it, but at the same time actively comes to stop the rhythm of the flank elements. In the composition on *pic. 23, b*, the reveal of space is mainly achieved by segmentation of its conditional borders. The rhythmic groups of the flat planes, oriented on two mutual perpendicular coordinate axes of the plane, are formed on the one side of the space. The other side by contrast with the first one is divided by elements performed by the curvilinear planes. The culmination node is emphasized by mass concentration, unexpected shift of the tridimensional spatial shapes from one side to the other, and relevant transference of their features.

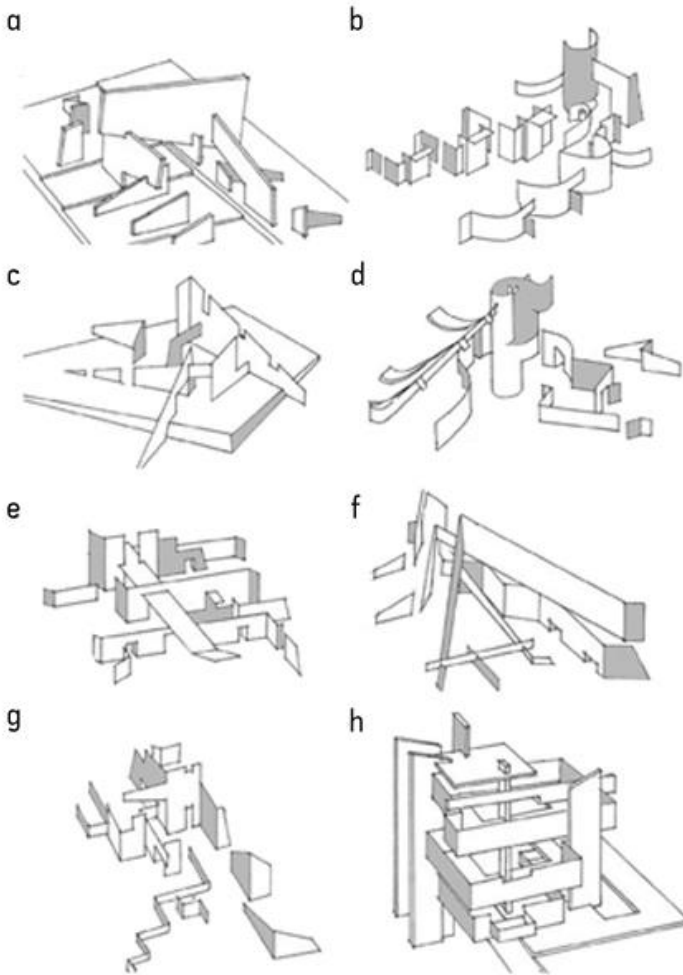
The more expressive way of space reveal (without emphasizing of metrorhythmic order) is used in compositions shown in *pic. 23, c, d*. In the work in *pic. 23, c*, it is divided in direction from periphery to the mid part along several deformed compositional axes in plan, and the main part of the structure is formed at the intersection of them. In the work in *pic. 23, d*, the space is divided from its borders to the mid part, but in the straight radial direction, and the core is emphasized by the large cylindrical spatially expanded volume. In both works the shapes concentrate as it goes to the core; they develop on the vertical coordinate, and appear to be the complexly segmented form making. The expectedly changing shapes pass their characteristics to the space which obtains the prominent orientation to the core, where several directions of compositional development cross.

In the composition shown in *pic. 23, e*, the space is divided in depth in variety of different ways: firstly, by the parallel series of the flat planes placed on the different plans; secondly, by increase of the height of these elements as it goes to the compositional center; thirdly, by increasing complexity of figurative development of the surfaces at the approach to the compositional dominant. The means of combination of the different zones of space are their abundance to their two main coordinates of the plan and active rolling compositional axis emphasized by the horizontal overhang spreaded above it, and also additional compositional axis fixed by enfilade placement of the different-sized embrasures in flat surfaces. In the model shown in *pic. 23, f*,

rhythmic series of different- amplitude elements are applied, which are oriented under inclination to the foundation plane and therefore setting an indication of simultaneous space development horizontally and vertically.

Many of the mentioned above ways and means are involved into the work for reveal of the space, shown in *pic. 23, g*. The space get some ‘entrances’ and goes for the compositional center in several directions, the main of which are emphasized by the more active figuratively developed flat planes, and also by the relief of maquette foundation. The height of the elements and density of their placement increase as it goes from periphery to the core. The core stands out of the other fragments of the space by intensity of segmentations, mass concentration, intersection of compositional axes and visual connections.

In the model in *pic. 23, h*, there is shown the rarer example of reveal of the space extended not horizontally but vertically. However, here there is also observed the use of rhythmic series of the flat elements (frames, criplings, bulkhead), which differ with in size and position in space with regard to the compositional center, formed on the top level of the structure. The compositional axis takes place in the form of conventional break line, oriented first horizontally, then vertically, and embrasures are left in lift slab of tiers for its emphasizing, and an oriel is made in the maquette foundation. Transition from the horizontal coordinate to the vertical one is performed in the structure behind the entry node emphasized by bulkhead console.



**Pic. 23.** Space reveal

It is necessary to underscore the importance for the significance of the revealed space of such a specific compositional feature as segmentation of the foundation surface. Almost in all examples shown in *pic. 23* there are used rampants and degrees of level variations, stilted levels of terraces and fragments of the recessed surface. Various divisions of the maquette foundation plane help to emphasize the compositional axes and centers, to form the main part of the structure and outline its secondary zones, to lead the audience up to compositional dominant.

## 6. COLORISTIC DEVELOPMENT of PLANE, VOLUME and SPACE

**Object:** studying of shape-generating capacity of the color, acquisition of ways to achieve the unity of compositional and coloristic organization of the form, formation of classical and expressive color combinations.

**Tasks:** provision of consistency of the color composition perception; organization of change of the color combinations in accordance with directions of its development; use of regular arrangement of color accents; consideration of regular strengthening or weakening of the color tension in definite nodes, emphasizing the culmination center (zone).

**Conditions.** It is necessary to consequently perform four tasks: one preparative and three posterior tasks on coloristic organization of the simplest architectural forms in the form of a plane, volume and space.

The task no. 1 consists of preparation of single-tone color triangles. It is required to achieve gradation (range) of the color tone (CT) based on one of the six main spectral colors (red, orange, yellow, green, blue or purple - as directed by teacher) by means of mixing of the spectral color firstly with white and then with black color, and to apply it on the series of squares placed in the form of triangle massifs as it is shown in *pic. 24, a, b*. The colored squares are further used as a set of monochromatic dots (supplemented by the way of exchange between the students of a group) for getting specific color combinations. From the prepared set of six single-tone color triangles it is necessary to put together a schematic spatial model of color solid (one model per group), which gives a graphical expression about the principles of color systematization and alternatives of selection of color combinations (*pic. 24, c*).

The task no. 2 consists of coloristic development of the plane. It is required to compositionally organize and reveal the plane by color (A4 size) with the help of several series of squares harmonized by color (with the 2 cm sides). In the process of the work it is necessary to monitor the achievement of contrasting and detailed color combinations, reveal of the center and periphery, emphasizing of static and dynamic of different plane zones, the use of metrorhythmic connections and ways of rhythm stop for formation of definite groups of the dots, interrelation of sizes of splashes of colors and their activity.

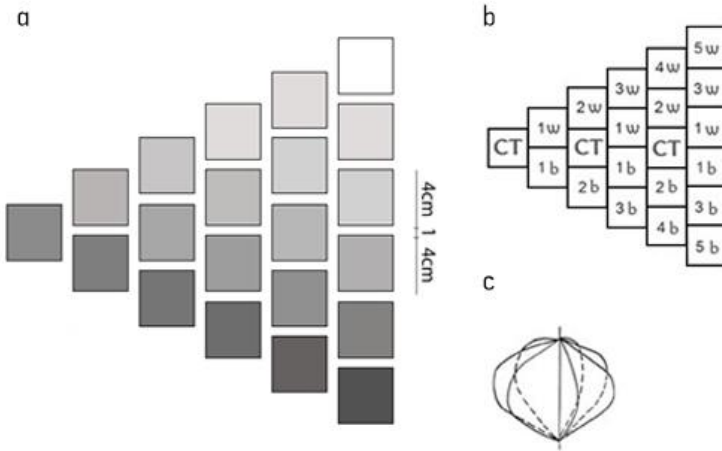
For more constructivity of the oncoming work it is suggested to use the perspective effect ensuring by the contrast color combination (an effect termed as secondary contrast). As directed by teacher a student forms a composition on the basis of the definite couple of the following chromatic contrasts: warm-cold, light-heavy, active-passive, short-long, strong-weak, spreading-concentrating. With the aim of arrangement of the expressive means and

convenient comparison of the results of the work it is necessary to orient the colored squares on the main coordinate axes, fixed by the plane edges. The last one can be placed vertically or horizontally.

The task no.3 consists of coloristic development of a parallelepiped (possibly a pyramid). It is required to insert the color on the surface of the involved volume in accordance with selected principle of formation of the new segmentations system in architectural form. Here it is necessary to achieve its major expressivity based on favour and integrity of the coloring, consistency of interrelation of compositional and coloristic means, unity of shape-generating way and spatial practice of polychromy, proportion and tectonics. The overall dimensions of maquette is from 15 to 20 cm, material is white paper, gouache. The model is fixed on maquette foundation, and the development of its surface in color is also possible. It is fine to use the color lines and splashes (graphical charts).

The task no. 4 consists of coloristic development of restricted internal space (in the shape of parallelepiped). For originality of compositional solution, it is necessary to specify the architectural task in the total approximation: for example, consider the interior of the hall (drill-hall, exhibition hall, merchandise space, gym hall, reading hall and etc.) as the development object. In the composition it is necessary to reveal the characteristic shift of the color graphical charts in accordance with the circulation pattern and terms of space perception, position of the culmination node, type of enclosing structures (walls and lift slabs), availability of aperture of windows and doors based on strengthening and weakening of the color tension. The relative dimensions of internal space are 10 x 20 x 5 m, the maquette scale is 1:50. One or two envelopes may not be included conditionally. The material is white paper, gouache.





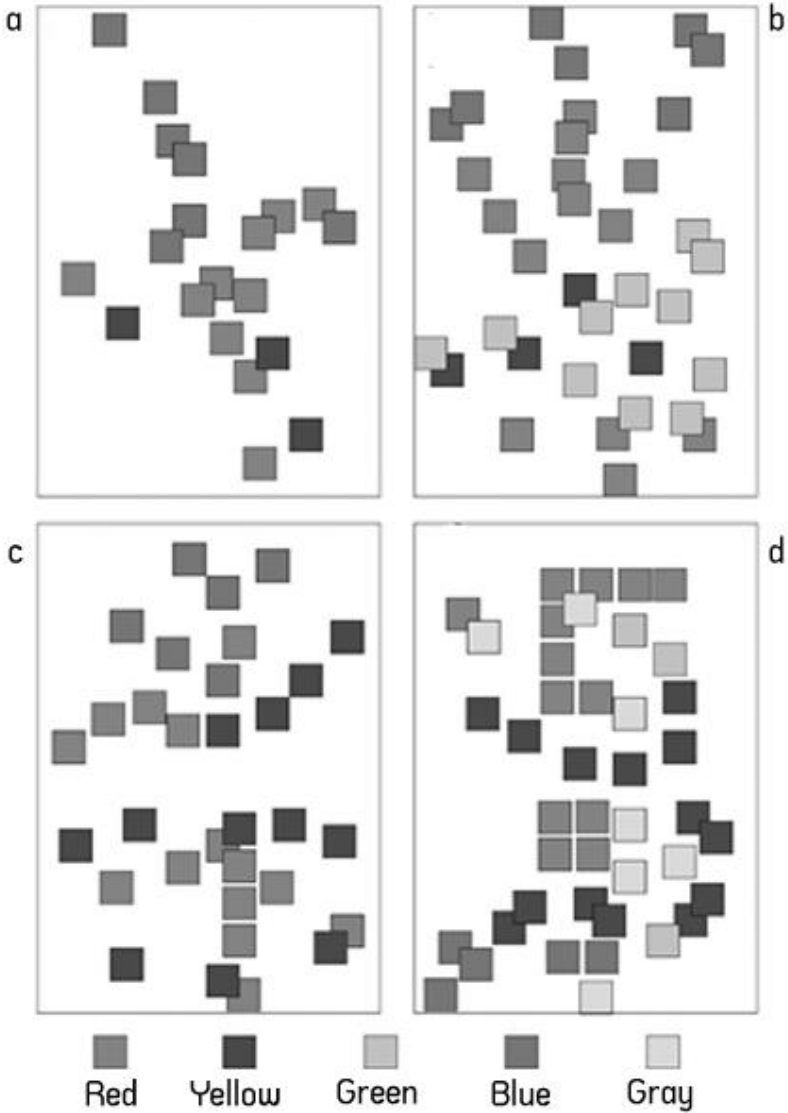
**Pic. 24.** Single-tone color triangle and a model of color solid:

a – gradation of color saturation; b – the way of mixing the main color tone with white (w) and black (b) color; c – schematic spatial model of the color solid (1-5 – proportion of the added color)

**Explanations.** While performing the task no. 2 it is necessary to focus attention on several interrelated sides of the work. Firstly, it is necessary to organize the space by the colored squares compositionally. Secondly, it will be required to organize metrorhythmical series of dots with the use of not applicable before visual feature as color. Thirdly, it is necessary to reveal the peculiar meaning content of coloristic composition with consideration to secondary chromatic contrast taken as its principle. Such kind of conditional division of the set tasks is expedient for details refer to work methods. Also the color of elements in illustrations is conditionally fixed in graphics, and the choice of solution is specified by way of explanation.

In the work shown in *pic. 25, a*, the square elements are concentrated alongside two almost mutual perpendicular coordinate axes, however not strictly attached to the paper edges. Applying of the color expands the compositional opportunities, as additional metrorhythmic connections appear into the formed series of similar-sized squares at the expense of gradation of the color tone. The tones of red and blue colors are used as concrete carriers of the chosen pair of contrast colors – warm and cold. In order to provide the synchronous action of compositional topic and coloristic solution in some odes of the surface in different combinations there are used metrorhythmic series in squares placement and in change of the color saturation, break of one and the other rhythm, the shift of the elements from the axis of the series, direction rearrangement which the color gradation develops in. the compositional center

is placed in the middle of the sheet, where the rhythmic series of the colored squares cross over, and where the fullest extent the chromatic contrast of the warm ad cold tones is emphasized purely coloristic.



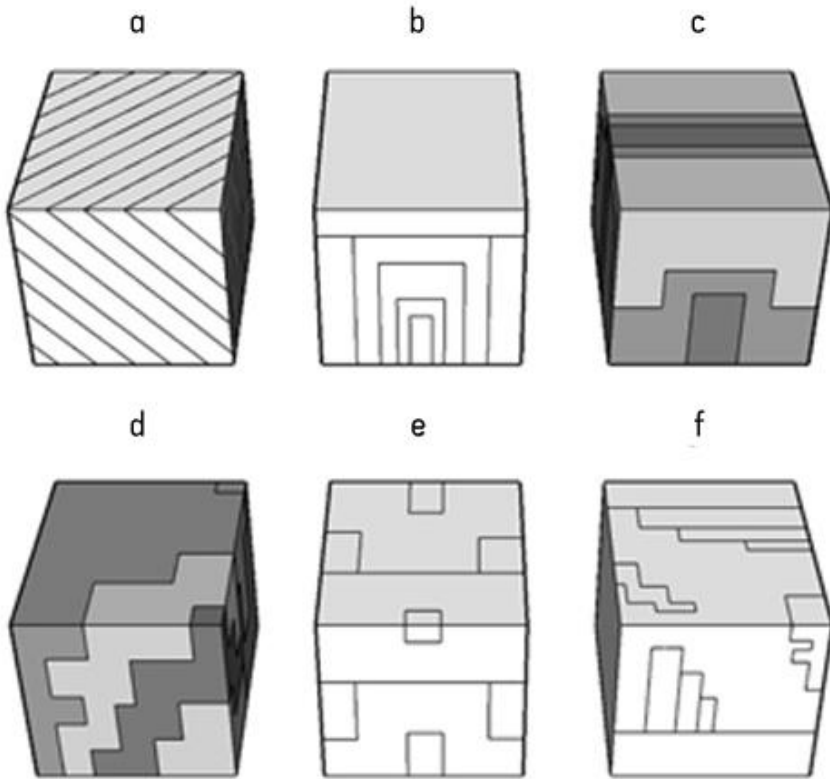
**Fig. 25.** Coloristic development of the plane by the means of color dot based on chromatic contrasts

It should be reminded that red, orange and yellow colors are perceived as warm ones; green, blue, purple as cold ones. The warm colors in comparison with cold ones as a rule are perceived to be more active, close, strong and spreading. In order to not allow the excessive garishness and wasting of expressive means, but to achieve the significance of coloristic composition on the plane, it is enough to use the dots of two contrast colors (of different brightness and saturation). Several elements of the other color can be used for emphasizing the compositional center and additional nodes, increase of rhythm of the numerous squares and unexpected break of the rhythm (counterpoint), and also with the aim of activation of the proper coloristic solution.

In the work shown in *pic. 25, b*, the coloristic organization of the plane is based on the other type of chromatic contrast between the spreading and concentrating colors. Therefore it determined the choice of formally compositional solution while placement of the squares. The rhythmic series of the dots diverges from the core where the contrast of the color tones is expressed the fullest extent. The longer and lighter upper series forming the ‘spreading’ zone are expressed by the varieties of yellow and yellow-green color. The shorter chains of the squares which visually reveal the narrowing and ‘concentrating’ the lower part of the paper, are colored in the cold blue tones.

In the composition shown in *pic. 25, c*, the picture of elements placement and the total coloristic solution harmonize quite expressively. Here the secondary contrast of the light and heavy color is used, and in this connection the same pair of the colors is used – yellow and blue. In the lower part of the vertically oriented sheet of paper the rhythmic gradation of blue color is performed: the number of vertical column set and blue-colored squares increases; saturation, solidity of the tone while moving to the core of the composition is strengthened (in the middle of the paper). the series of yellow elements are differentiated the other way: they disperse from the core as limbs of the tree stem; their color changes from the gold-green to the light-yellow one.

For the formation of coloristic composition based on the secondary contrast of active and passive colors (*pic. 25, d*) there is chosen the way of contradistinction of a group of squares forming the regular almost rectangular mesh of the elements (passive), however separated on several fragments, and dynamic chain of the squares, visually destroying the consistent order and penetrating the plane on cam rail (active components). The active elements are represented by the squares of deep red color, and passive ones – the tones of grey color. For the increase of the coloristic expression and compositional emphasizing of culmination node in the place of rectangular mesh break except the gray squares there are placed several dots of green color.



**Pic. 26.** Coloristic development of the volume

In the task no.3 it is necessary to simultaneously determine the pattern of placement of the color graphical charts and to select color scale. The characteristic features of task performance consists of the following. Firstly, it is fine to use any segmentations of the surfaces of the simple volume by the color in the form of lines, plashes, large fragments and coloring of all planes. Secondly, it is required to consider the multiplicity of view points on the model and perception of certain color forms in contrast to the other ones and in conjunction with them. Thirdly, there emerged a necessity of organization of the contiguous zones of different planes.

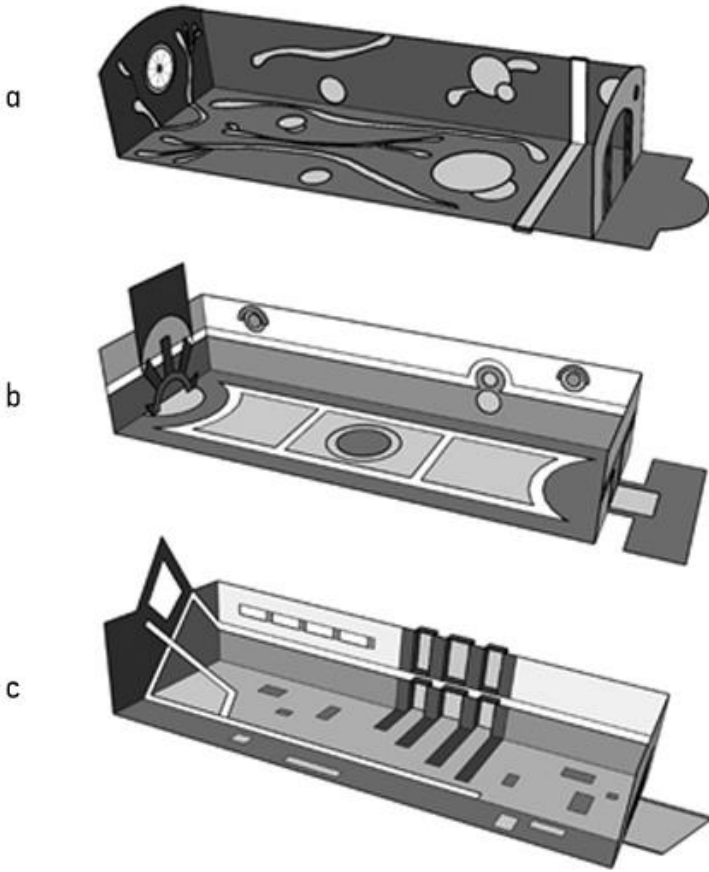
In compositions shown in pic. 26, the coloristic development of parallelepiped is achieved in various ways, for example, by width consistence and segmentations amplitude with the help of conventional oblique cutting planes (*pic. 26, a*) or identical orientation of coordination axes of the complex outline of the color graphical charts (*pic. 26, b*). For coloristic organization of the simple volume it is sufficient to use the one color stretches with receiving of its gradation on brightness and saturation (*pic. 26, c*) or several colors of different tones (*pic. 26, d*). More complicated balance state of the allied planes

means appears while involving of the horizontal, vertical and oblique segmentations in their different combinations under condition of combination of the straight-line and curved boundaries of the color graphical charts in the symmetric (*pic. 26, e*) and non-symmetric (*pic. 26, f*) compositions.

In the task no.4 the new way of architectural task solution is coloristic organization of the planes, surrounding the determinate space. Not only placement and shape of the architectural constructive elements (for example, apertures of windows and doors), but also introduction of the color graphic charts on the envelopes assumes great importance for individuality of the composition. Generally the place of the main aperture of a door determine the compositional axis of the space directed to the culmination center, and the dimensions and number of apertures of windows and color splashes form the space scale. The choice of the subject of the coloristic development of adjacent planes, the rhythm break or extension of the color graphic charts while transition from one plane to another get great significance. A new tectonic task appears – reveal of upper and lower enclosing planes (floor and ceiling), difference of the top and bottom of the lateral surfaces.

Thus, the expression of coloristic organization of the simulated space of the exhibition hall (*pic. 27, a*) is achieved by combination of the wiggly colored lines, round and oval splashes applied to the walls (in combination with round aperture of windows) and floor, and also by strong decorative accent (also round) on the end wall next to three part aperture of a door. The wiggly lines (colored and white) evoke associations related to the movement of water flows; they can be applied on the surfaces colored by different tones of single color (blue, for example). The compositional center on the end wall is emphasized by the large round aperture and white ring, joining several radical colored rhythmized sectors.

In the composition given in *pic. 27, b*, there are used the ornamental motifs associated with gym hall. These are the direction lines on the floor like the marking of a playground, combination of the round splashes of colors on the walls, reminding of flying away balls. On the bottom margins of the envelopes the decorative lines are applied. They reveal the tectonics of the wall construction system and at the same time join the allied planes and different sized aperture of windows placed on it. The chosen colors: yellow – for coloring of floor and walls (main part); gradation of pink, red and brown – for coloring of splashes and strips. The compositional center on the end wall is emphasized by the largest semicircular aperture, divided by the centering of the colored cover and window sill belt.



**Pic. 27.** Coloristic development of the internal space

The features of coloristic development of the space shown in *pic. 27, c*, are also restricted. It is divided by extensional and horizontal stripes associated with constructive features of the architectural form and compositional requirements of reveal of the hall deepness. The stripes applied on the surface of the floor and walls are of solid color (for example, brown), but of its different saturation within the range of length of each strip (i.e. with expansion). The color saturation increases while moving to the compositional center. The last one is placed on the end wall with the help of crossing over color graphic charts and apertures of windows formed between them. Some of the other apertures separates the surface of the longitudinal wall, and together with the color stripes determine the cross cut segmentations of the space. On all the examples given in *pic. 27* it is necessary to pay attention to significant compositional role of small space out front the halls.

## **7. MUTUAL INTERACTION of STRUCTURE and POLYCHROMY of ARCHITECTURAL FORMS**

**Object:** contemporary acquisition of main regularities of figurative form making and equivalent measures of polychromy; education of attitude of students on a color as to one of the visual means and development of capacity for goal-oriented organization of color scheme of the subject-spatial environment.

**Tasks:** application of color as additional opportunity for provision of unity and harmony of the tridimensional spatial form on the higher level; formation of metrorhythmic series of architectural elements and their segmentations with application of differences on all visual means; building of co-ordination system of divisions of the volume spatial form; provision of correlation of the coloristic solution and constructive compositional building of the form; prevention from the anti-tectonic solution, and also wasteful use of the color; emphasizing the main part of composition and achievement its unity and expression.

**Terms.** In the capacity of basic model for performing of this task is accepted the maquette prepared during the work on task no. 5. It is required to construct the similar by its parameters volume spatial structure, in which the color will compete the impression of its figurative development. The color of maquette material - white paper - is considered to be the main color. This task contains 3 assignments.

In the assignment no.1 it is necessary to reveal the frontal plane placed on the horizontal maquette foundation in front of the audience. The plane dimensions heightwise and widthwise are from 10 to 25 m; the proportion of the length frontwise to the height is in an amount of 1:2 to 2:1.

In the assignment no.2 it is necessary to reveal the volume concerned from all sides at a human height. The segmentations of the shape can be pass-through and light. The greatest dimension of the volume heightwise and in a plan is up to 15 m.

In the assignment no.3 it is necessary to reveal the open space. The total square area of the organized space which the volume shapes are placed on composes up to 1,5 thousand m<sup>2</sup>; the ratio of square sides is from 1:1 to 1:4; the maximum height of the shapes applied into the space is up to 30 m.

The maquettes are performed in the scale of 1:100 (task no. 1 and 2) and 1:200 (task no.3).

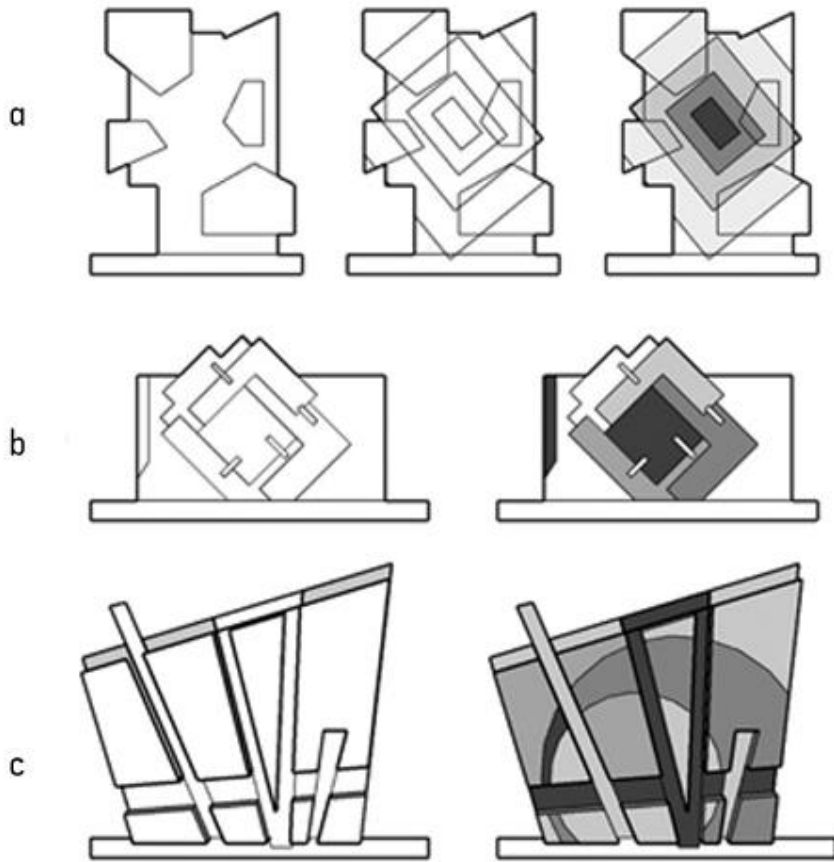
The works have to demonstrate the achievement of interrelation of segmentations performed by the way of co-ordination, and the total unity of

architectural form base on the combination of different features of the used elements as well as the color. It is necessary to pay attention on the balance state of the flat elements, three-dimensional configurations and fragments of the space, to set more favourable location of the audience with regard to the volume (in a plan and heightwise), the main ways of movement of the audience to the dominant part of composition (in space), to monitor the appearance of the proper proportion (depending on magnitude relation of segmentations and relief depth).

**Explanations.** The chosen method of task performance allows understanding not only the opportunities of figurative form making but also the methods of contribution or their substitution by polychromy. By virtue of color it is easy to convert the initial metric series into the other more complex one, one rhythmic regularity - to the other one and even into the whole 'family' of them, leaving unaltered all previous characteristics of the series (quantity, dimensions of elements and intervals). Moreover, by the virtue of color it is possible to create a system of segmentations absent in the basic structure. The chosen colors emphasizing the same elements in various ways, differently deliver them to the perception of the audience: some elements are marked as main ones, the other are considered as secondary, and the third as neutral ones. With the help of polichromy the value of component compositional elements can differ in a wide range.

The search of ways of color application should clearly be in definite interrelation with the special aspects of the structure of the tridimensional special shape. The color scheme should economically complete the form making expressing the character of composition by the relevant color formation. Emotion-image expression of the color scheme visually demonstrates the key distinction of monochrome composition from the coloristic one. However, the full suitability of coloristic and formal compositional developments of the shape prevalently sets the color spatial structure the schematic tone. Banality overcoming, achievement of unexpected effect depends, for example, on introduction of counterpoint, on some offense of the obvious appropriateness of the accent color and form making regularity, even on their definite contradistinction. By virtue of color it is possible to organize the original rhythm, new proportional ordinance, unordinary scale assignment of the structure with the environment, unique coloristic significance, to emphasize and even shift the main coordinate axes and compositional center. The important principles of creation of the polychromic tridimensional spatial structure is full emphasizing of their visual completeness, independence in the environment, inner color unity, connections with the other color spatial shapes.





**Pic. 28.** Polychromic compositions on plane reveal  
(recommendations on choice of the color tone are given in explanations)

Among the compositions on plane reveal (task no. 1) these principles are clearly expressed in the work shown in *pic. 28, a*. In the basic model (at the left) there was used a rhythmic order of several elements, developing the figurativeness of the surface, and differently oriented in regards to the system of horizontal and vertical coordinate axes. Application of new segmentations performed by color in polychromic composition (at the right), the directions of which even partially coincide with compositional axes, accepted in 'white' structure, complicated and enriched the previous rhythmic structure, and coloring of the fragments of the surface in a single color but its different gradations on brightness and saturation helped to compositionally join the groups of elements. Apply of a single color provides economy of expressive features and at the same time comfortable understanding of the rhythmic

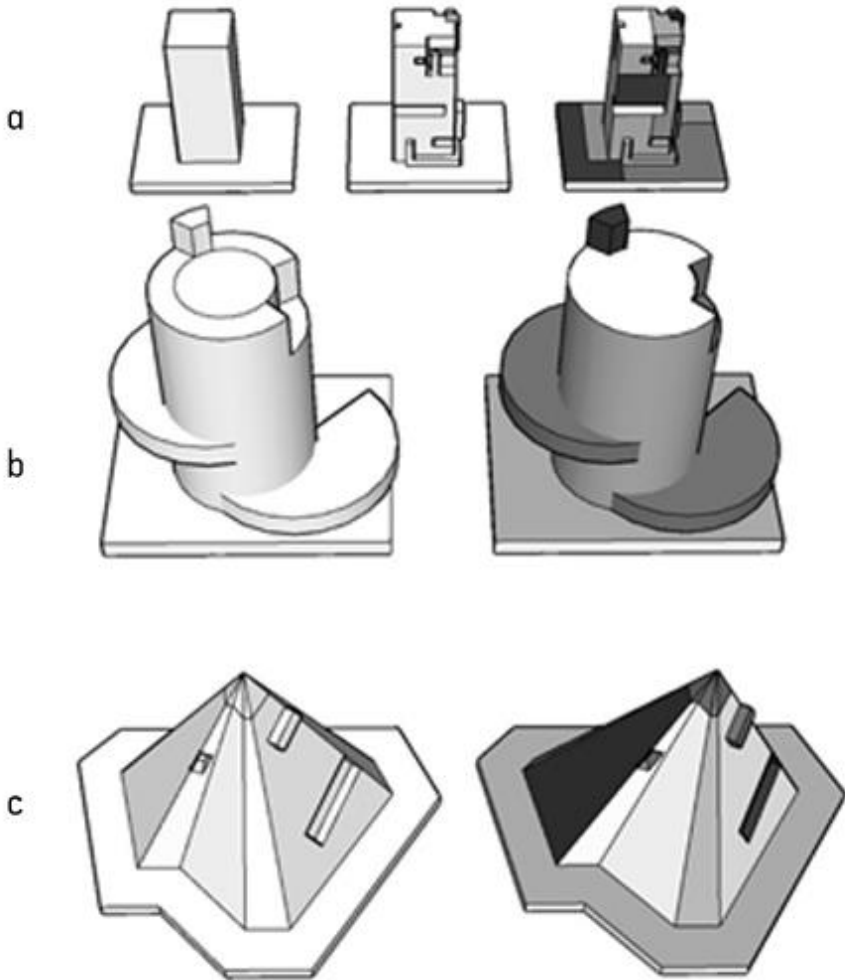
interrelations. Here the colored square is emphasized by more saturated tone. This square underlines the position of compositional center already fixed in the basic model with the help of figuration of surface, but turned to be more expressive in polychromic model.

In the work given in *pic. 28, b*, new segmentations performed by color coincide with direction of rectangular disk planes. However, the basic elements are colored not across the width, that is why even in the result of implementation of gradation of the same color at least 2 times more components of composition is received. The well understand regularity in the rhythmic change of elements features (similarity of geometric shape, differences in position in space and by color tone) provides the completeness and harmony of architectural form. It is necessary to mark that in the works shown in *pic. 28, a, b*, the other way of gradation of the surface fragments, from the more saturated in peripheries to the more light while motion to compositional center, could be used. With such kind of graded subdivision of color scheme of the surface the choice of concrete color turns to be secondary and is determined by esthetic preferences of the author.

In the composition on *pic. 28, c*, the structure of front surface, which is more complicated and expressive in comparison with the basic model, is organized by virtue of rhythmic series of a pair of color tones (for example, yellow and brown). Its complexity is achieved by increase of number of the associated segmentations, consequent change of the color tone in two interdigitating rhythmic series of the surface fragments, as if emanating in waves from the culmination center. The main part of the basic model has already been emphasized by orientation to radial striations. In the polychromic work it is additionally emphasized by structuring role of active white color: white oval splash breaks the rhythm of concentric arcs as counterpoint providing stability of dynamic composition.

Among the works on reveal of volume (task no. 2) the role of color is clearly seen on the model shown in *pic. 29, a*. The basic structure (in the center) was constructed with the help of different coordinated with one another, but quite abundant segmentations, and for this reason, it differs by certain fractionality and small proportion. Polychromic work (at the right) is concisely divided in to several horizontal zones with the wavy edges, outlined on the surface of the volume with consideration of their best perception among previous straight-line segmentations. After fixation of the zone borders there was made a choice of the used color - there were suggested the gradations of one color (for example, brown), but of different saturation and brightness. At this time the coloring of the belts changes regularly: firstly, the lighter belts are punctuated with darker ones, complicate the rhythmic order; secondly, while moving from the bottom upwards all belts become lighter embracing the tectonics of architectural form. Let us focus on access of the color graphical

charts on the maquette foundation. Such kind of way allows visually involving, ‘attaching’ the high prism to the foundation surface and to provide the expression of volume composition for account of attraction of the external environment.

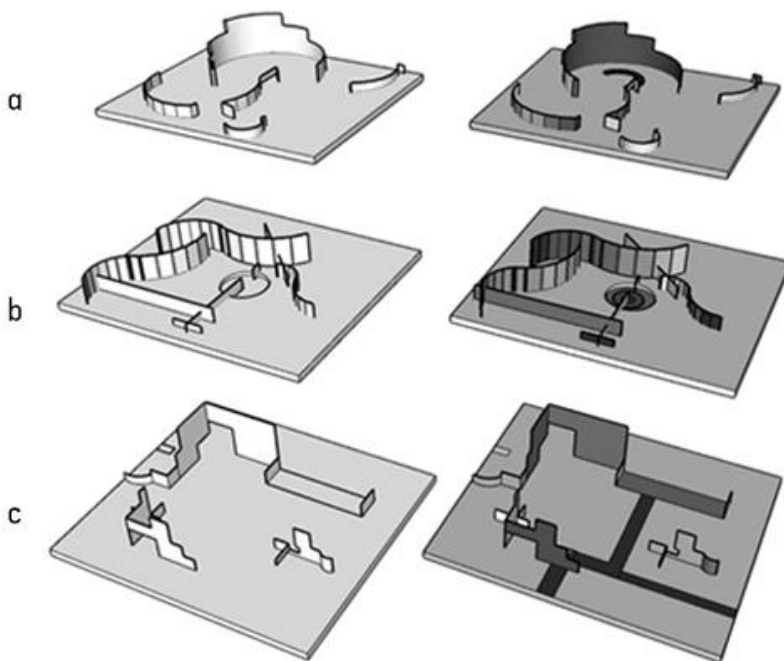


**Pic. 29.** Polychromic compositions on volume reveal

In the basic composition of volume reveal shown in *pic. 29, b* (at the left), the main expressive means are cornices of variable overhang projected from cylinder, and *клиновидные вырезки массы*. However, the rarely placed and small segmentations of the original structure left sufficient space for their supplementation by polychromy. The rhythmic order of intermittent cornices is supplemented by the regular placement of the comfortably adjacent with them

colored rectangles of different dimensions. The absence of vertical divisions in the basic model was compensated by appearance of color belts in polychromic composition, separating the free fragments of the surface of the cylinder. When choosing the yellow color as a main ground-color it is appropriate to involve the graphic charts of purple or brown tone.

In the polychrome composition in *pic. 29, c*, the segmentations existing in the basic structure, revealing a cross-section of its triangular plan, are marked by color, and also the system of newly formed division of the inclined outline is performed. The fragments of the surface surrounding pyramid in its lower part and emphasizing the massiveness and stability of all the volume are marked by more dark intense color (for example, brown with gradations of light-yellow of the main ground color). With the same aim in the lower tier of composition the color graphical charts open into the maquette foundation, go down to the 'bottom' of flute on the surface base.



**Pic. 30.** Polychromic compositions on space reveal

In the polychromic composition on surface reveal (task no. 3), shown in *pic. 30, a*, the rhythmic connections of the complex shaped elements separating the space in depth, and the main its part in vertical, are strengthened by the use of several color tones (for example, yellow, brown and red). The newly formed

flexible in the plan width of the intense (red and purple) color emphasizes the compositional axis of the space, and its curved perfection marks the zone of compositional center. In the model in *pic. 30, b*, the centric structure of the main part of the space is revealed with the help of three colors. The elements planes surrounding the core and referring to it are colored by the yellow width, external planes and annular strip around the perimeter of the extension in the very core is colored by gradations of brown. The two leading components – a circle in a compositional center and vertically emphasized dominant – are marked by active red color. Several color graphical charts (colored in brown tones with color extension) forming the rhythmic order are applied on the plane of foundation revealing the space division in depth in the direction to the core.

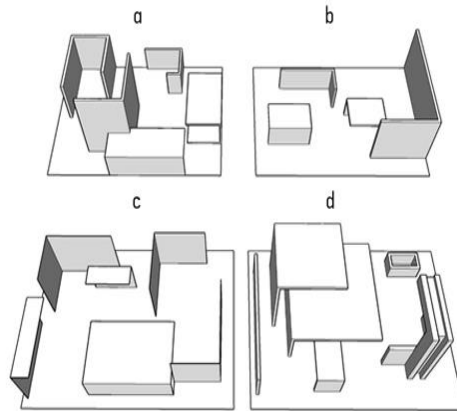
In the composition shown in *pic. 30, c*, it was sufficient to apply only two color tones (for example, yellow with brown or pink with purple) for combination and at the same time differentiation of structurally complex form makings separating the space in plan and partially in the vertical line. The width of intense (purple) color splits the maquette foundation on compositional axis, and then ‘climbs up’ on the surfaces, outlining the main part of the space. The compositional center was emphasized by a small square splash of an active color tone (for example, red) as a counterpoint. Let’s pay attention to the fact that in the last works all outline surfaces and maquette foundation are not colored: the color graphical charts are clearly seen on the white ground color.

## 8. COORDINATION FORM the VOLUME, IT'S INTERIOR, ENVIRONMENT

**Object:** the further study of general compositional regularities; acquisition of ways and organization facilities of tridimensional social form, the expression of which is specified by interrelation of the exterior content, internal space and environment.

**Tasks:** organization of interior space restricted by the material surfaces; formation of externally perceived harmonic bulk of building with the help of these surfaces; provision of interrelation of the internal space and environment (the open space around the volume is considered).

**Terms.** It is required to build a single compositional system of several (3-6) restricted closed spaces directly associated to each other. In certain instances for the more convenient perception of compositional solution of interior space, it is necessary to conditionally remove overlaps. The space dimensions can be in contrast and nuance relationship. The interior spaces are restricted by flat surfaces (individual solid elements in the interior are excluded), which can cross over or adjoin to each other. In addition, all surfaces should be placed in parallel with three main coordinate planes. The surfaces of foundations of the open and close spaces can be on the same or different levels.



**Pic. 31.** Interrelation of the three-dimensional configuration, its interior space and environment

The external shape should figuratively reveal the compositional organization of internal spaces, and be determined as single cubage. The connection of internal space with the environment should be supported by direct flowing over of the fragments of open and close spaces with the help of

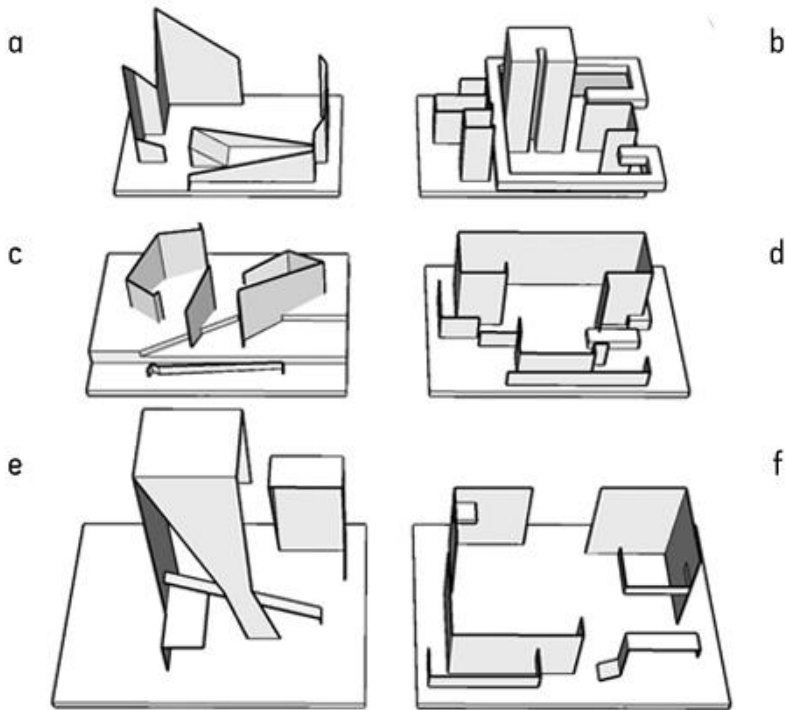
planes, which are common for internal space and outdoor environment, and also by the use of intermediate half-closed spaces.

The maquette is constructed of single-tone paper or hardboard in the 1:50 ratio. The dimensions of close spaces are from 2 to 6 m. The composition is placed on the square of 20 x 20 m dimensions (i.e. the maquette foundation dimensions are 40 x 40 cm). In order to determine the scale it is necessary to show the human figure.

**Explanations.** The expressive exterior content of architectural structure can be achieved only in the processes of segmentation of the complete interior space and further combination of these parts in the developed tridimensional spatial structure. The organization of internal space is corrected by the simultaneous harmonization of elements, which take part in formation of the exterior content and provide the interconnection with the environment.

For example, in composition shown in *pic. 31, a-c* (it is presented in three different perspectives) the main part of the space is organized by only two mutual perpendicular surfaces. The core of the structure is emphasized in exterior content by increase of the height of these surfaces and is supported by several secondary zones developing the space in plan and supplementing the core per cent volume in volume. The direction of the main approach to the architectural form is emphasized by arrangement of the rampant in front of the main entrance, i.e. the dominant part of the space is additionally emphasized by segmentation of foundation surface.

The same principle of supplementation of the main core by the adjoining secondary volumes is used in the work shown in *pic. 31, d*. The internal space is organized more entirely, but it is also separated by a system of horizontal and vertical elements. In the extensional building this is reflected in the graduated treatment of the form. In the general structure there was increased the unifying role of the internal space developed vertically. The direction of the main approach is emphasized by segmentation of the surface foundation and vertical deviation-focus.



**Pic. 32.** Interrelation of three-dimensional configuration, its internal space and environment

The compositions given in *pic. 32*, differ in the ways of division of the internal space on fragments and at the same time their joining, and also by the method of discharge of its part in the external volume. Thus, in the work shown in *pic. 32, a*, the complete interior space is split by gradual building of the foundation surface, and culmination node is formed between the highest, deformed in plan fragments of non-load-bearing planes. In the model on *pic. 32, b*, the internal space vessels are grouped around the persecuted but vertically developed core. The deformed belt of the horizontal cornice, penetrating all the formed structure, got strong compositional significance. The space is actively split in the work shown in *pic. 32, c*. Here the dominant subject is its development in peculiar spiral order, reflected in formation and plan, and external volume, which consist of several sections placed concentrically around the core and gaining height. The direction of space development and connection with the environment are revealed also by differentiation of the level of surface foundation.



In the composition in *pic. 32, d*, the internal space is emphasized by the closed one. However, the exterior content acquired rich figurative segmentation, which is achieved by numerous movements of vertical planes in plan, which at the same time determines the peculiar adjustment of the planning solution. In provision of the relationship between the internal space and the external volume regulation of the height of the vertical planes, the availability of numerous lining elements supporting them, as if permeating the structure, became of great importance. In compositions given in *pic. 32, e, f*, the internal space is determined entirely, developed in accordance with vertical coordinate by establishment of very high border planes, separation of the foundation on levels. These characteristic features also had an effect on building of внешнего объема – in comparison with more massive upper part and spatially developed the lower part of the shape.

## **Conclusion**

The goal of the theory of architectural composition as a science consists in study the terms under which a cause leads to the desired effect, or in other words, under which the possibility of the desired results becomes reality. Inventing, combining and comparison of various architectural and spatial elements to achieve a certain artistic effect is an indispensable part of the creative process. A developed mechanism for forming an architectural composition should come to the aid of the designer. Unfortunately, it cannot be reduced to one formula. It is necessary to use various theoretical principles and perform several stages of practical searches for a compositional solution. We repeatedly emphasized that among the identified features of the formation of a harmonious architectural form, there stand out the fact that at the initial stages the degree of freedom in the selection of components is quite large. The every path forward is increasingly contingent on previous one. In this case, the designer must regulate the properties of the components, differentiating them into main, secondary and additional ones, selecting the appropriate place for each of them. It is this methodological approach used in the practical tasks for this course.

## References

1. AGHAYEVA N. (2021). Regeneration of the architectural heritage of cities based on urban ecology. Spirit time №1(37). ISSN 2522-9923
2. BOĞENÇ, Ç., AGHAYEVA N. (2022). Role of heritage in the sustainable development of historical cities - modern approach in the context of Baku city. International Smart Journal. e-ISSN: 2630-631X
3. BOĞENÇ, Ç. (2020). A Studio Experience in Basic Design. Current Researches in Architecture and Engineering Sciences. Iksad Publishing House. ISBN: 978-625-768710-2. s:23-35
4. BOUCHARENC, C.G. (2006). Research on Basic Design Education: An International Survey. International Journal of Technology and Design Education, 16, 1-30
5. COOPER, R. (2019). Design Research – Its 50-year Transformation. Design Studies, 65, 6-17.
6. DEMİRKAN, H. (2010). From theory to practice opinions. In A.Williams, M. J.Ostwald, & H. H.Askland (Eds.), Creativity, design and education. Theories positions and challenges, 56–59.
7. DİNO GÜRSEL, İ. (2012). Creative Design Exploration by Parametric Generative Systems in Architecture. METU Journal of Faculty of Architecture, 29(1), 207-224.
8. ERSOY, M. (2016). Kentsel Planlama Kuramları, İmge Kitabevi Yayınları, ISBN: 978-975-533-521-6, 440p.
9. FIEDLER, J. & FEIERABEND, P. (2000). Bauhaus, Berlin: Published by Konemann FROMM, E. (2004). Çağdaş Toplumların Geleceği, Arıtan Yayınevi, ISBN:9789757582298, 144s.
10. GÜNEŞ, S. & KESTİ, H. (2018). Katılımcı Tasarımın Felsefi Kökenlerine Dair Bir Soruşturma ve Hartmann'ın Yeni Ontolojisi, Sanat Tarihi Dergisi, Aralık, 193-209.
11. LEACH, N. (2009). Digital Morphogenesis. Architectural Design, 79(1), 33-37. LESTER, D. (2013). Measuring Maslow's Hierarchy of Needs. Psychological Reports, 113(1), 15-17.
12. LOVE, T. (2000). Philosophy of Design: A Metatheoretical Structure for Design Theory. Design Studies, 21, 293–313.
13. ONAT, E., (2013). Mimarlığa Yolculuk, Efil Yayınevi, ISBN: 978-605-4579-48-8, Ankara, ss:211
14. ÖZER, D.N., (2005). Denver Sanat Müzesi Eki, Yapı Dergisi, (280):69-72
15. SARIOĞLU ERDOĞDU, G.P., (2016). Temel Tasarım Eğitimi: Bir ders planı örneği, Planlama, 26(1),1-13
16. SARIOĞLU, G. (2016). Temel Tasarım Eğitimi: Bir ders planı örneği. Planlama, 26(1): doi: 10.5505/planlama.2016.52714

17. SEYLAN, A., (2005). *Temel Tasarım*, Dağdelen Basın Yayın, ISBN: 9750015800, Samsun, ss:17
18. SILBERNAGEL, J. (2005). 'Bio-regional patterns and spatial narratives for integrative landscape research and design', in *From Landscape Research to Landscape Planning: aspects of integration, education, and application*, ed. B. Tress (New York), 107–18.
19. TOK, E., SEVİNÇ M., (2010). *Düşünme Becerileri Eğitiminin Eleştirel Düşünme ve Problem Çözme Becelerine Etkisi*, Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 27:67-82
20. TUNALI, İ. (2020). *Tasarım Felsefesi*. Mak Grup Medya Pro. Rek. Yay. A.Ş. ISBN: 978-625-44420-5-6, 170p.
21. WHITE, K., (2011). *Sanat Okulunda Öğrenilecek 101 Şey*, Yem Yayıncılık, İstanbul, ss:101
22. YANG, X., CHENG, P. Y., LİN, L., HUANG, Y. M., & REN, Y. (2019). Can an integrated system of electroencephalography and virtual reality further the understanding of relationships between attention, meditation, flow state, and creativity? *Journal of Educational Computing Research*, 57 (4), 846–876.
23. YILMAZ, S., DÜZENLİ, T., ÇİĞDEM, A., (2018). *Peyzaj Tasarım Eğitiminde Bir Biçim Arama Yöntemi: Doğadan Esinlenme*, *Journal of History Culture and Art Research*, 7(2), 376-389
24. СТЕПАНОВ А.В. (ред.), Малыгин В.И., Иванова Г.И., (2007), *Объемно-пространственная композиция. Архитектура-С. Москва*, ISBN: 5-9647-0003-9,256с.
25. ЧИНЬ ФРАНСИС Д.К., (2021). *Все об архитектуре. Форма, пространство, композиция*. АСТ, ISBN:978-5-17-135344-5, 448р
26. ШИМКО, В.Т., (1990), *Архитектурное формирование городской среды*. Высш. шк., ISBN 5-06-001069-4, 221с.



**Associate Professor Narmin AGHAYEVA**

In 1987, she started her undergraduate education in the Department of Architecture of the Faculty of Architecture of the Azerbaijan Architecture and Construction University and completed her master's and doctorate education. During this process, she worked as a lecturer at the Faculty of Architecture, Department of Architectural Project and Urban Planning at the same university until 2015. In 2014, she worked as a lecturer in the Department of Architecture at the Faculty of Architecture and Fine Arts of Sivas Cumhuriyet University in Turkey and continues as a lecturer in the Department of Architecture at Karabük University Başak Cengiz Faculty of Architecture since 2021. She has 37 published scientific works: 9 books, 28 scientific articles, 1 book chapter; participated in conferences held in Azerbaijan and Turkey with scientific articles and theses. 7 International exhibitions have been presented and passed.



### **Associate Professor Çiğdem BOĞENÇ**

After completing his undergraduate education at Karadeniz Technical University, Department of Landscape Architecture, he completed his PhD in 2016 with his doctoral thesis titled "A study on the development of the world heritage Safranbolu area management plan". He received the title of Associate Professor in the field of Landscape Architecture on 21.10.2022. Since 2011, he has been teaching undergraduate and graduate courses at Karabük University, Department of Architecture and Landscape Architecture, on planning, design, nature and design relations, and creating environmental awareness in individuals. Although his work is on project design and planning, he has consulted and implemented many implementation projects in the public and private sectors. Especially for the work he carried out at Karabük University, the University was deemed worthy of "The Global Green Award" in 2014. He has published 17 articles, 2 books, 11 book chapters and more than 30 national and international congress papers.



**Prof. Dr. Banu BEKÇİ**

Banu BEKÇİ received her master's and Phd. degree from Black Sea Technical University in the major of Landscape Architecture. After completing her Phd. degree, She continued to work at Bartın University. During this time, she did many Works on urban landscape studies and management, urban environmental and local government policies, conservation of cultural landscape assets, and urban sociology. From June September 29 to September 16, 2013 (for 3 months), she worked as a guest lecturer in the Geospatial Information Science & Technology Program Department of North Carolina State University in Raleigh, America. She currently Works at Recep Tayyip Erdoğan University, Department of Landscape Architecture, as an Prof.









**ISBN: 978-625-367-451-9**