

УДК 745/749

DOI 10.47367/0021-3497_2025_3_267

**PROBLEMS OF SHAPING
IN TECHNICAL AESTHETICS AND DESIGN**

**ПРОБЛЕМЫ ФОРМООБРАЗОВАНИЯ
В ТЕХНИЧЕСКОЙ ЭСТЕТИКЕ И ДИЗАЙНЕ**

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В представленной статье рассмотрено происхождение дизайна, история его формирования и развития на базе различных наук. Дизайн, сформированный на базе технической эстетики, сегодня стал глобальной областью науки и искусства. На основе проектной деятельности он реализует возможности решения системы человек-предмет-машина-среда в творческом процессе. Определяются техническая структура и художественно-образные формы предмета на основе принципов формообразования.

Профессионализм дизайнера характеризуется тем, насколько он способен правильно и пропорционально выбрать способ создания образной формы с учетом утилитарно-функционального назначения изделия и эстетических факторов. В этом случае проектированный продукт или объект будет более эффективным и комфортным.

The article presents the origin of design, the history of its formation and development based on various sciences. Design, formed on the basis of technical aesthetics, today has become a global field of science and art. It implements the possibilities of solving the systems of man-object-machine-environment in the creative process on the basis of project activities. The technical structure and artistic-figurative forms of the object are determined on the basis of the principles of shaping.

The professionalism of the designer engaged in design activities is characterized by the fact that he is able to correctly and proportionally determine the indicators of the utilitarian and functional purpose of the product, including aesthetic factors in the created figurative form. In this case, the designed product or object will be more efficient and comfortable as functional, as well as aesthetically pleasing.

The issues discussed were analyzed in various practical examples and summarized in the section "Conclusion".

Ключевые слова: наука, эстетика, исторический период, техническая эстетика, дизайн.

Keywords: science, aesthetics, historical period, technical aesthetics, design.

Introduction

When speaking about designer creativity in the field of form and aesthetic factors of form-making, it is necessary first of all to pay attention to the conventional word "aesthetics", its objectivity as a scientific term, its content, as well as its connection with formation, including its role in the creative sphere.

The term "Aesthetics" was first used in the 1750s by the German philosopher and founder of German classical aesthetics Alexander Baumgarten. The term itself comes from the Greek words (aistueses) "estezis", which means "feeling" and "aistuetikas", which means "to understand through feeling". A. Baumgarten wrote his two-volume work in Greek and called it "Aesthetics" (the first volume of the work was published in the 1750s). In this book, he first attempted to clarify the content of aesthetics and its position among the philosophical sciences. A. Baumgarten called it "primary epistemology", "the younger sister of logic" and "the science of sensory cognition". According to the philosopher, "aesthetics" means "the completeness of sensory cognition in itself", and "perfection" means "beauty" [1].

Thus, in the second half of the 18th century, aesthetics as a philosophical discipline was established in universities and academies in Europe, including Germany. In various cities, Berlin, Halle, Bonn, Jahn, etc., new publications devoted to philosophical sciences appeared. Some German aestheticians, such as I.A. Eberhard, T. Eschenburg, K. Meiners and other authors, following A. Baumgarten, began to divide aesthetics into theoretical and practical parts. Later, aesthetics as an independent philosophical science began to be studied by university scholars in other European countries, including Russia [1].

In addition to the above-mentioned, we would like to note one more point. Thus, the problem of studying beauty through aesthetics was discovered long ago, even before the creation of this science. H. Alizade wrote about

this: "For the first time, aesthetic problems from the point of view of philosophy, that is, philosophical aesthetics, were used in a continuous and systematic form in classical Greek philosophy and in the works of ancient Greek philosophers. From this point of view, we know that aesthetics has a two-thousand-year history. In more ancient periods, in a number of religious, literary and philosophical books in Egypt, China and India, the main thoughts and statues about the knowledge and concepts of beauty were written, and all this is known to science" [1]. It should be noted that even in ancient Sumerian texts one can read corresponding views and thoughts on current problems of modern aesthetics [2]. Various decorative objects and similar samples found during archaeological excavations, related to the ancient period, clearly express the primary aesthetic views and opinions of man. The monumental portrait of the ancient Egyptian queen Nefertiti is a clear example of human beauty or the beauty that a person would like to see.

The ideas and thoughts about beauty, formed in ancient times, were formed in the system of relations between man-society-nature and became one of the main parts of the socio-cultural development of civil society. Since ancient times, man's attitude to beauty has been manifested in the tools of his labor, in the material environment created and designed by him, etc.

As already noted above, aesthetics, which goes back to ancient roots and was formed in philosophical creativity, developed as an independent science, in subsequent stages of history penetrated into many spheres of human activity, and also played a fundamental role in the development of various spheres of art.

The dictionary "Aesthetics" gives the following definition of the objects of aesthetics: "Aesthetics is the science of the nature and laws of aesthetic assimilation of realities." "The famous Russian thinker N.G. Chernyshevsky gave a very simple definition of aesthetics: "Aesthetics is the science of the beautiful." But the famous

M.S. Kagan said that "aesthetics is the science of aesthetic assimilation of beauty by man" [1]. Aesthetic assimilation of realities, its aesthetic attitude to the surrounding world with a formative approach create motivation for aesthetic activity. And aesthetic activity in another source is explained as follows: "... this is every human activity that conveys the national essence. The universal form of aesthetic activity is creativity based on the laws of beauty. Because, every form of perception of the world also occurs according to the laws of beauty" [2]. According to the interpretation in the Russian dictionary, aesthetics means philosophical knowledge of the essence and forms of beauty in literary creativity, life and nature, and also conveys the theoretical foundations of design, including the study of its social nature, methods and principles of artistic design, as well as the creative tasks of a professional designer [4]. In this sense, in the technical sphere, aesthetic activity is called "technical aesthetics" and "design".

The ideas of technical aesthetics originated in the first half of the 19th century, long before the advent of design. In 1805, an article by the French writer T. B. Emeric-David "On the influence of painting on the art industry" appeared [9].

According to the author, in scientific and literary terms, technical aesthetics generalizes the experience of mass production of tools, reflecting utilitarian and aesthetic qualities by means of modern production in industry and based on the laws of beauty [2]. It studies the laws of shaping and composition of products, develops the conditions of technical and economic indicators of product quality, the means of production of these products and the environment in which they are manufactured. In addition, it gives recommendations on the formation of a "technical landscape" in organizations [7].

In other words, technical aesthetics solves theoretical aspects of the harmonious creation and organization of the system man-thing-machine-environment, etc. problems in the direction of realizing the most comfortable conditions for human life and activity.

In the projecting processes of design creativity, in the formation of things and equipment depending on their content and purpose, it is

very important to take into account a set of requirements that are determined by aesthetic factors at one level or another. Form is a broad concept and covers all being in the conditions of time and place of residence. Form creation has come a very long way in the creative process of design and in other areas of art, and also covered cultural traditions and features in various historical periods [6]. Material existence, which has any form of structure, including creative patterns, according to its structural characteristics and mainly according to ideas, is divided into three groups: container-medium, thingness and flatness. In general, form means the visual essence of the content or any of the structures of objects and creates the first information about it and forms the obvious imagination. Every animate and inanimate existence in nature is found in a corresponding form of structure. Form distinguishes one object or thing from another by their various features and by their specific features. Acquaintance with form is based on visual perception. Visual perception in a complex form gives information about the special features and content of form. Many sided peculiarities of the form, which exists in nature, forced different artists and architects always think about them. They conducted a lot of research in these areas and tried to apply the corresponding structures of forms of nature in their work. In this area, the views and creative experience of Leonardo da Vinci are amazing [10].

However, the application of perfect structures of the form existing in the nature in this or in another form in the architecture or in design creativity has been always in the focus of attention.

The applied objective laws in the creation of form mainly consist of symmetry, asymmetry, golden division, system of convenience, etc. The structure of form, which is based on the same objective laws, as is known, exists in its individual parts - in nature. Without taking into account these objective laws, of course, it would be more difficult to obtain an ideal solution for creating form in the creation of a thing. In this case, the same objective laws in design engineering and the possibilities of their application in the creation of a thing should always be in the center of attention.

Nowadays, geometric patterns in the structure of forms of real creatures and plants existing in nature are widely analyzed by designer K. Elam, a teacher at the Florida Institute of Art and Design (USA). The books written by him about research on the same problem aroused great interest throughout the world [3].

In the manufacture of things and devices, the patterns of symmetry and asymmetry characteristic of form-making are widely used. Symmetry is divided into various types:

- mirror symmetry;
- axial symmetry;
- spiral symmetry.

The manufacture of various things is based on the corresponding types of symmetry [8].

An asymmetrical object is not based directly on axial symmetry. But in the production of such things, the laws of balance in composition are used. For example, the use of scissors, kitchen knives or a chopper for their intended purpose, to be based on the corresponding asymmetrical structure, does not create any problems in their use. Some of these things - scissors or a knife can also be in a symmetrical form.

But there are many things, equipment, including vehicles, which function dictates to be in a symmetrical form. Of course, these problems are carefully analyzed in the technical and design solution for the formation of the same products and vehicles. We can consider them in some samples. For example, instead of asymmetrically placing various parts in the overall internal structure of an airplane, helicopter or car from the point of view of the overall internal form, they should be in a symmetrical form. This structure guarantees an aesthetic appearance, as in nature, also in a similar structure of forms, which optimizes their functionality. Apart from these, other goods are an armchair, a table, a chair, samples of various kitchen utensils, including glasses, handles, etc. Appliances should be based on a symmetrical structure of form in terms of their purpose and aesthetic requirements as well as for their functionality. At the same time, some of these things and utensils give place to asymmetrical modern structure of form. In this case, it is necessary to pay special attention to the features that are determined by artistic and aesthetic factors and complex requirements of creating form in de-

sign. Since, we need to use the features and rules of composition in design creativity to achieve a holistic, expressive and harmonious formation on things and in other design creativity.

With all this, it should be noted that the creation of form along with the constructive structure of things is also an important factor in ensuring the aesthetic appearance of the composition with the implementation of the creation of decorative elements on them. At the same time, when designing things and equipment, along with the classical constructive structure, the focus should always be on the optimal and expressive solution of shaping and decoration, conditioned by modern requirements in the processes of creative activity, as the main responsibilities in the future.

Methods

It should be noted that the designer, when designing certain goods and things, separately analyzed their prototype, and also considered their positive indicators and disadvantages (if any). At the same time, he/she brought an innovative approach to the formation of things and realized that the visual expression, artistic and aesthetic solution, etc. elements of the ideological content should be based on his/her subjective imagination. And then, in order to create a greater imagination about the good, he/she repeatedly gave a visual description on the appropriate formats and sometimes made models, if necessary. Individual parts and details were prepared on the basis of precise drawings. However, a new good was created on the basis of existing prototypes, and the worker looked through the map to perform the functions as intended. In addition, there is also a problem of designing things and equipment on new types, in accordance with the requirements of modern conditions, which is still relevant.

In general, in creative design activities, it is more useful to conduct a comprehensive analysis of the prototype in many aspects. First of all, it should be noted that the creativity of things in the processes of socio-cultural and technical-cultural development of society, which is in development in accordance with the level of requirements of the modern state, and as society develops, any good and thing, being the final

product of the same creativity, differing from previous prototypes, is created more perfectly from the point of view of modern principles. In other words, an innovative thing is created on the basis of an outdated one. That is, during certain periods, a thing is a means of use in accordance with social requirements, and then becomes a model for creating a new prototype in accordance with changed requirements. It should be noted that for various areas of social activity, a number of things and equipment are created, and then sometimes later they are modernized in accordance with social requirements, and, as a rule, the society dictates it. Other types of products, including textile utensils, are modified according to social requirements and the requirements of modern mass fashion. Fashion is always changing and updating, and sometimes later they return to the previous fashion - to classic forms, and then again after some time they return to more fashionable forms or models. We can see the same processes in the example of many clothing items. For example, suits (especially coats), ties, watches, etc. are modernized in different periods, and sometimes later they are replaced by classic models again. But, again turning to classic models and adding new elements, at the same time more attention is paid to modernization and enrichment of the decor. Or let's look at household items or services that are intended for tea, coffee or other drinks. In the modern period, the same things are produced in various types, such as conical, quadrangular, hexagonal and other shapes. Designers explore new models and shapes to attract customers and try to meet their constantly changing demands and needs by presenting things in unconventional forms. People change the location of furniture in their houses from time to time, and they need to change or update household items and clothes because they are tired of them.

Thus, the creation of form in things and equipment is determined by classical forms and the requirements of modernity. But there are such things and equipment, the replacement of which with a new model comes from the socio-cultural requirements of the modern period. Because the renewal or replacement of this or that device is very important in order to take its place in the general harmony in the en-

vironment of things and space, which is improved and guaranteed in a complex form. For example, in the complex preceding period, the produced samples of tables, telephones, watches or heavy televisions, radios, etc. were replaced by their new, innovative prototypes, and they are more suitable devices in terms of functionality and are based on a modern form structure. Of course, sometimes later, when they go out of fashion, they will also be replaced by new and innovative devices, which will be based on socio-cultural requirements, which are always changing. In this sense, the renewal and modernization of the human-things-machine-environment system in accordance with the requirements of modern conditions based on perfect structures and principles of form-building should be the focus of attention of specialists and designers [5].

Discussion

Solving problems in the creation of things and the environment, there is no doubt that the role of design in accordance with ergoesthetic requirements is on two parallel lines; when expanding the analyses carried out on multiple things and devices, the reliability of the same processes proves itself. As is known, when shaping things, maximum consideration of utilitarian and functional indicators creates a more effective guarantee of its practical purpose. In addition, attention should be paid to the definition of artistic and aesthetic indicators in accordance with the level of shaping. It is the responsibility and professionalism of the designer in his work that should consist in a sufficient assessment of the two specified moments-factors and their correct consideration when designing them. That is, for what conditions and practical purposes are things intended, and at what level should their functional indicators be? To create a clearer idea of these same problems, it would be interesting to look at some things that are used in mass form. For example, there are many interesting designs of ordinary teaspoons that are used and produced in different countries nowadays. And, of course, there are many differences in their shapes and decors. But, the same function of the same things is to collect granulated sugar or coffee and mix or stir it in a liquid (boiled water, milk, etc.). Sometimes it is used for eat-

ing jam, sweets, etc. Here, two main functional indicators should be in the foreground when producing and designing the same things. This means that the spoon holder should be wider, and the lower part should be deeper, capacious for collecting granulated sugar, etc. It seems that the utilitarian and functional indicators of the shapes of things dictate themselves. The declaration of the structure of the shape of the thing from the point of view of aesthetics with various decorative elements fades into the background. Unfortunately, at present we can often find such products that do not meet the standards for practical requirements. Thus, in many cases their depth is insignificant, their holder is narrower and has a quadrangular shape. Thus, such a design makes it difficult to hold them and creates an uncomfortable situation with constant use. Using other tableware as an example, the molding and decor could be analyzed differently. For example, a regular hand towel is produced in a simple, elongated and quadrangular model with flat bases and in a standard shape. The declaration of one and the same thing is carried out with the help of colors and texture on a composition consisting of any decorative elements. Based on observations, it can be said that not only on towels, but also on bed linen produced in different countries, more colorful examples of declarations are given, which are full of arbitrary, inexpressive and mostly unaesthetic elements. At the same time, the product instead of the declaration is not serious, but here are such moments that their consideration is very important [11, 12].

The content of the thing is related to its functional indicators and the directions of its purpose, so that it focuses on the same features. In many cases, the content requires that the decorative elements be given in accordance with the rules and regulations. For example, on blankets, bedspreads, pillows, the declaration elements with a wide description of colors or abstract, unaesthetic and tiresome elements (especially in dark colors) are not well-groomed. Or on a sofa - armchair, and bedspreads, it is inappropriate to give a tiger, a rhinoceros and their capacious description of the ancient Egyptian pyramids for decoration. Instead, we often meet such decorative samples in markets and shopping centers, at the same

time we see the decoration of elongated quadrangular figures and the creation of a form of intersections of vertical and horizontal lines and a description on fabrics in different colors and locations. On these samples, parallel lines of different colors and thicknesses and a large number of intersecting lines are sometimes used, including wide and narrow strokes are also used. Such decorations are also located on the texture. When the squares are small, they are given colorfully. In a certain sense, such decorations based on classical traditions seriously influence and differ in their aesthetic views. But here we should not forget one point. The explained forms of decorations on clothes, on various household appliances, including curtains, which everyone uses for the aesthetic solution of the interior, samples should be applied based on the principles of the corresponding measures. For example, on various items of clothing, these square measures should not be the same measures as they are given on the covers of sofas and armchairs. At present, we often encounter such samples of clothes that are made with such and other discrepancies in their sizes and designs. For example, on scarves, T-shirts, other clothing samples gave wide decorations based on square, quadrangular figures, and they have an unaesthetic effect. Unlike fabric samples, on the considered textile products, it is advisable to give botanical ornaments and the like elements based on plant samples in small measures according to their volume. Such decorations have a positive effect and never get boring. In addition to them, straight and wavy lines with different colors can also be used here. Parallel to such lines there can be metric or rhythmic decreasing and increasing scales.

Conclusions

According to the analyzed processes, it is concluded that the functionality of the tableware, even if it is considered in the background, requires the decor to match at the appropriate level. This means that the products of the light industry in specific standard forms of bed linen sets, kitchen or bath towels, etc., utensils of artistic design will better correspond to their content.

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Поступила 21.11.24.
