

## Раздел 4. Техническая эстетика и дизайн

## Section 4. Industrial art and design

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### COLOR SCIENCE: THEORY AND PRACTICE

#### Abstract.

As you know, colors play an important role and value in solving aesthetic problems in creative activity in design, in the visual arts. From this point of view, the physical properties of flowers are analyzed, as well as their psycho-emotional impact on humans.

This article discusses the scientific and theoretical views and experiences of various well-known experts on colors in different historical periods. Summarizing the studied materials and proceeding from personal practical experience, the classification by colors is presented by the author.

The use of colors in artistic activities based on the classification is commented.

**Keywords:** color, theory, psychophysiology, spectrum, classification, design.

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Even from ancient times, people became interested in color and used them in everyday life – dwellings, clothes, objects. Colors, along with their aesthetic meaning in the life of ancient people, also expressed their mythological worldview, religious and ideological views in one form or another, and then, at different stages of social life, also had sociocultural significance.

Color and color schemes have been studied from time to time and have become a separate area of research. It should be noted that the problem of color was also the subject of research by ancient philosophers and thinkers. Famous Greek philosophers Plato, Aristotle and others conducted research in this area. Their scientific work played a role in the further study of colors.

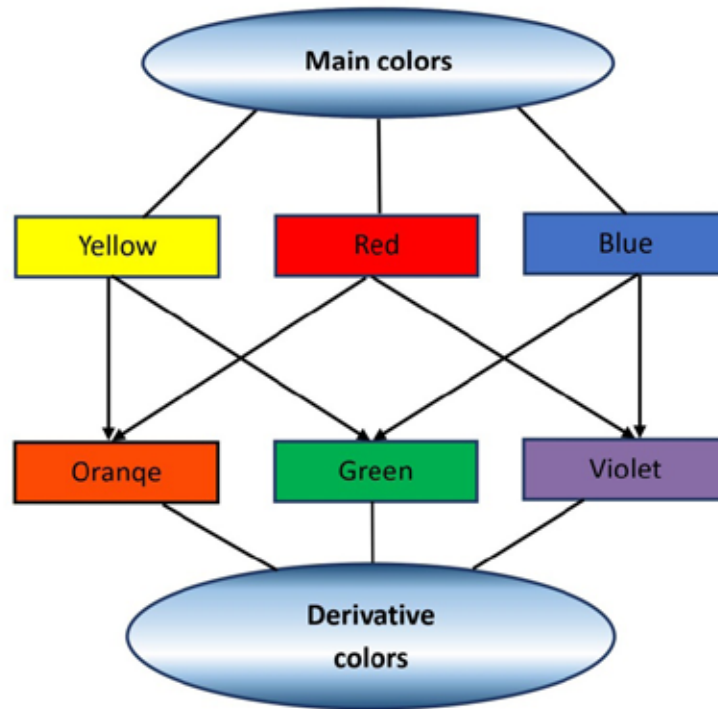
The thoughts and conclusions about the psych emotional peculiarities of colours by Russian scientist M. V. Lo-

monosov, English scientist I. Newton, Germany philosopher V. Hote, well known painter, graphicist, theorist and pedagogy V. Kandinsky, Francis specialist of technical aesthetic J. Veneno, Francis scientists M. Deribere, Russian psychologist V.M. Bekhterev, Switzerland psychologist M. Lüscher and etc. assume very high importance in the chromatics science. Put forward thoughts and conclusions have played very important role in the mainly investigation and study of colours, including in their practical application opportunities in different spheres too [2, c. 116–117].

The colours divide into chromate-coloured (in Greek origin means – “chromos” – colour) and achromatic-colourless types. In the scientific specialists literatures yellow, orange, red, blue, cyan, green, violet and other many colour shades includes to chromatic colours, these colours have characteristics of colours [6, p. 87].

Cording to the scientific literature, there are three of the four primary colors that are considered major – red, yellow and blue; and one is green, obtained by mixing

colors. The determined color system is shown in the following diagram (scheme1) [3, 107].



Scheme 1.

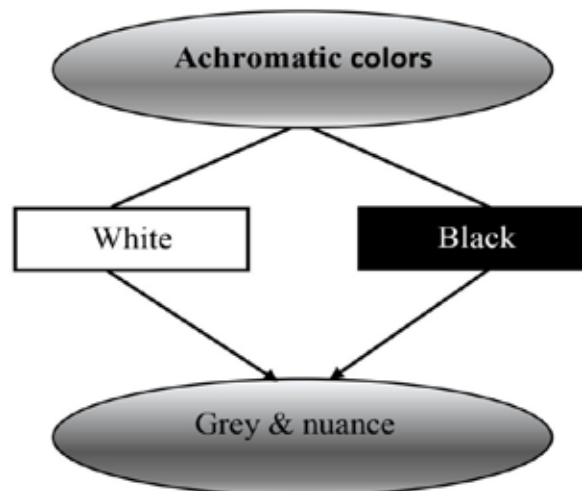
The main characteristics of the color are determined in the following sequence:

- color tone – color property;
- saturation – color quality;
- lightness – the quality of the observed color, built up by the sensation of a greater or lesser degree of relative brightness.

The colour shade characterizes for their wavelength superiority and noted with nm (nanometer). The wave-

length of different colours in the specter was determined as following. Violet – 390 ... 450, blue-450... 480, cyan-480... 510, green-510... 550, yellow-575... 585, orange-585... 620, red- 620 ... 800 nm. [6, p. 87].

To achromatic colours included–white, black also grey which derivate from them and its different (dark, light shades), (scheme 2) [3, p. 108].



Scheme 2.

First of all, prominent English physicist and mathematician Isaac Newton explained the colours nature. He defined visible light as a physical factor in the perception of all colors. He showed that white sun shining joins seven different colours on itself. They are red, orange, yellow, green, cyan (blue), indigo (blue) and violet.

From all these colours' junctions creates the white colour. We should note that red, blue and yellow of those seven colours consider the main colours. Being different from I. Newton, as a poet V. Hote attracted by colours' romance and their influence peculiarities to human's sentiment. He wrote: "The colours can create the emotions on humans ..." Conditionally he divided on colours into two groups – bringing happiness and cause of sad and investigated them separately [9, p. 62].

Jack Veneno the founder of Technical Aesthetic Institution of France the professional specialists on colours' climate wrote: "The colours are very capable: it can make calmness and irritant light. It can create the harmony and shock; we can expect from them both miracle and commotion" [1, p. 37]. Another Francis scientist M. Deribere separately analyzed the different colours' viewpoint of psychology and showed that they directly influenced to the act and humans' health [1, p. 39–40]. The emotional – psychological peculiarities of colour, natural influences and importance has explained in another source too [11]. V.M. Bekhterev the famous psychologist generalized all his experience on colour's influence to organism and come to such conclusion that in the future would be efficiently used from the colours in treatment of nervous diseases. In some scientific works by Timiryaze was about the colours and their emotional and psychological reacts on humans [8, p. 129].

The humans with higher skin and optic sense can even determine the colours with their fingers. The humans with higher skin and optic sense can even determine the colours with their fingers. After many practical experiments carried out by ourselves we got know that such "definition" is obviously possible in special position of organism.

Formerly, such interesting experience was created out on the students of the department of "Artistic drawing" in the chair of "Pedagogy and psychology" of the Pedagogical Institute in Nizhny Taghil. Mainly, the same ability was discovered on ten of fifteen students [10, p. 64].

Switzerland psychologist Max Lüscher offered the colours' tests which were methods for analyzing of per-

sonality and at the same time formed complete direction on the science about the colours [5, p. 108].

In the creativity on different types and genres of fine art the colours are one of the most powerful influential means and is investigated and studied their different shades of artistic–aesthetic, emotional-psychological and semantic peculiarities in according level, but in the technical aesthetics and in design creativity the investigation and their studies according to their physical and psychological properties and influences beside above-mentions assume very high importance. Because, in different spheres of design creativity optimal application of colours and the main problems on appointment of objects and things create effective warranty for composition of utilitarian – functional and psychophysiological requirements.

The creation of *human-thing-machine-environment* systems and perceiving of colours in its organization and their psychological influence to humans have seriously investigated by the specialists, and achieved interesting results in this aspect. It is natural that under the modern condition uses from opportunities of chromatics science not only in the solution of artistic-esthetic assignment of interior and exterior, it also uses widely in industrial design-in decoration of things and equipment. Of course, the projecting ware of designer who deeply investigated the problems of colours problems and correctly used their application will be always attract the attention and ensure the tastes of buyers.

The problems about the semantic and psychophysiological influence of colours were based and explained in different scientific-specialists literatures in according level [1; 4; 6; 7; 11;]. On the base of scientific-theoretical conclusions, also on the base of individual observations and experience the colours can be classified according to physical properties and psychological-emotional influences on different groups (main colours, derivate colours) as following:

- chromatic-achromatic;
- hot-cold;
- active-passive;
- dark-light;
- vivid-weighed;
- contrast-relative;
- optimist-pessimist;
- irritative -calmness;
- symbolic and etc.

In industrial design, in industrial graphic, advertisement, artistic bundle, artistic encase and etc. creative

works, the classification of colours application with taking into the consideration the different and multi-sided peculiarities could create effective guarantee to the solution of general composition viewpoint of visual requests of artistic-aesthetic, psychological-emotional and usability.

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