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SCIENCE THROUGH THE PRISM OF ART: INTERCONNECTION AND INTERDEPENDENCE

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Art and science are two fields of human interest without which a man could not imagine his life from time immemorial. There is an opinion according to which they are interconnected and interdependent on each other. At the same time a lot of people strongly believe that they are two completely opposite directions in human development.

The purpose of the article is to establish the influence and relationship between science and art.

In both science and art, the inspirational idea and environment play a significant role. Some scientific discoveries seem to come out of nowhere, while others are made with great difficulty. The scientific view of the world is much more precise, while the worldview of an artist appears to be more abstract. If we argue about the relationship between science and art, we can say that artists assess the world generally by means of feelings and emotions. They invent various technical mechanisms to model the action of certain objects, without going into the details of their functioning. Scientists, on the other hand, often bring these objects to life, draw their thoughts from the fruits of the art, and, taking advantage of important insights, make discoveries [3].

If the influence of science on art is caused primarily by the presence of a cognitive component, then the opposite influence - art on science - is caused by the presence of an aesthetic component in scientific activity. Art itself, as the kind of activity responsible for the satisfaction of human artistic needs, appears to be the main way of developing a sense of beauty, the art of evaluating the aesthetic qualities of objects and phenomena. For the scientist, aesthetic aspects are thought to be additional but very powerful way of testing the truth of his intellectual potential. For the scientist, art is the main factor that stimulates the creative process giving rise to a state of emotional excitement and inspiration, as well as liberating the imagination. Art enlightens and enriches his mind. The biography of some scientists shows that some of them were not far from art. For example, Einstein played the violin, S. Morse painted pictures, and M. Lomonosov is famous for his mosaic paintings [5].

Art has long used scientific knowledge. For example, it is well- known from the history of art that mathematical and optical images influenced on the state of architecture and painting. Painting came into being much earlier than science. It is enough to remember the rock paintings of our ancestors. However, the formation of such science as chemistry contributed to the origin of new paints, which expanded the palette of artists. With the invention of glass, the techniques of smalt and stained glass emerged [4].

As for mathematics, its connection with the fine arts is quite obvious. For example, one of the most famous achievements of Renaissance artists is the invention of the mathematical scheme - linear perspective. Any student knows that an artist should know the laws of perspective reduction [3].

Having examined geometry, one can make sure that the same terms are present both in this exact science and in drawing: line, form, construction of geometric bodies and figures. The geometric style was very evident even in the art of antiquity (ancient Greek vases, composed of geometric forms, with strict compliance with the laws of symmetry). The laws of composition in the fine arts are closely related to geometry, as well. They include the distribution of figures and objects in space, the establishment of volume relations, light and shade gradations and the search for a compositional center.

During the composition and art history lessons we can get acquainted with another very important concept for artists and mathematicians - the «golden ratio rule». Despite the fact that the artist and the scientist solve different problems (the first - comprehends the relationship of man with other people and himself, the second - explores the laws of the universe), both science and art serve the same purpose: the search for truth and harmony in the world around us [4].

The Mona Lisa is surely a work of art known to everyone. It has been the subject of many studies and analyses and has been the subject of many myths and legends. On this example, you can easily prove how mathematics has influenced painting.

Perhaps the most striking example of Mona Lisa's mathematics is that the composition of the painting is built on the «golden ratio» more precisely on triangles that are parts of a regular star-shaped pentagon. But this is not the most striking example in the work of Leonardo da Vinci, showing the influence of mathematics on painting, namely on the composition of the picture.

Among Leonardo da Vinci's works, The Last Supper is one of the best examples of the use of the golden ratio or divine proportion. You can notice the observance of geometry in the background, for example, the clear rectangles depicted in perspective, on the walls, ceiling and windows. The composition of the painting is mathematically simple and rigorous.

It's worth talking about it in more detail. The picture depicts 12 apostles. They are arranged around their Teacher in two groups on each side of him and three in each group. The two groups closest to Christ appear more compact. It is as if they are inscribed in two triangles framing the triangle of the central figure. Two outermost groups are shown more quietly and broadly. They form quadrangles. The entire composition of the painting is strictly symmetrical and strictly balanced in relation to the vertical axis passing through its main point.

Thus, the geometric center of the painting and its semantic center strictly coincide, and the rays consisting of the ceiling vault and walls, converging at the main point, further draw the viewer's attention to the center.

It is hardly possible not to recognize the global impact of the scientific and technological revolution on humanity, which in turn caused a wave of understanding the problems of the time by artists and fiction writers. Thus, the connection between science and art is undeniable and indisputable. Both these ways of learning the world are aimed at solving one problem – the search for Truth, in this endless search they complement each other and have a direct impact on each other [1], [2].

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