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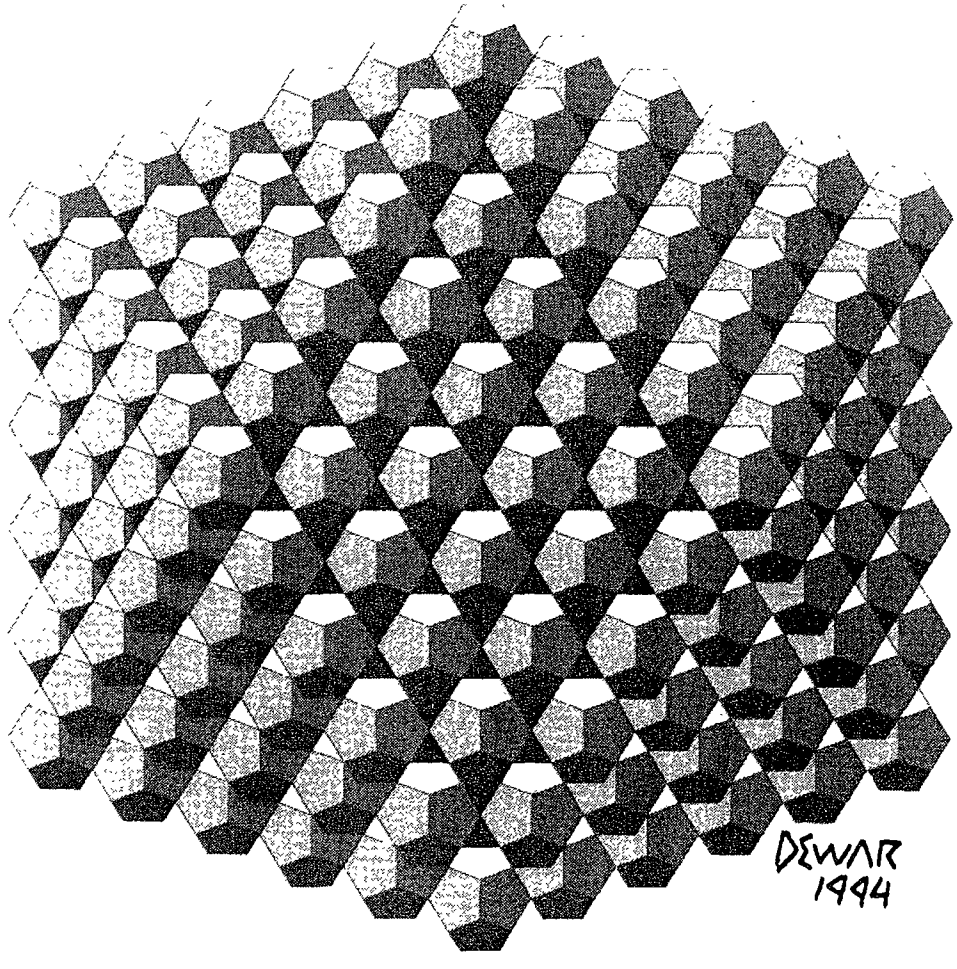

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FUNCTIONAL BRAIN ASYMMETRY IN PAINTING CREATIVITY AND RHYTHMS IN PAINTING EVOLUTION

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In modern psychology of creation is conceived a new scientific trend - a study of creative processes and their results in the light of the functional assymetry of human cerebrum hemispheres. A detailed study of functional pecularities of each hemisphere gives evidence that a prevalence in psychological activity of a left hemisphere is characterized by the features of analytics, rationality, verbalization, whereas at prevalence of right-hemispherical processes - a creative activity is characterized by intuitiveness, figurativeness, synthetical character [4]. Thus the motives are provided for separation of the two polar types of creative process, which one can conditionally call the left-hemispheric (L-type) and the right-hemispheric (R-type). Certainly, the relative prevalence of one of these characteristics is apparent, but not the absolute domination of one process by another.

A predominance phenomenon of one from two (L- or R-) types was examined upon material of creation in such different spheres as music [21], architecture [4], and others [5]. In recent investigations [1], characteristics have been found in artists' work that can be interpreted as indicators of the domination (in the creativity of these artists) of one of two components: drawing style or colour. From the neurophisiological point of view, these two styles can be attributed, respectively, to L-type (analytic) or to R-type (synthetic) domination of brain activity.

Ten parameters of painting were chosen (throgh several methods, including factor analysis) to describe the domination of the processes discussed above:

DRAWING STYLE PARAMETERS	COLOR STYLE PARAMETERS
1.Inclination toward normativity	Inclination toward originality
2.Rationality	Intuition
3.Strict form	Free form
4.Limited express means	Diversity of express means
5.Dominance of grafic features	Pictureusqueness-dominance of coloristic features
6.Steadiness, static features	Expressive, dynamic features
7.Discrete elements	Continuious transitions between elements
8.Inclination toward cool part of spectrum	Inclination toward warm part of spectrum
9.No gradation within each color element	Much color gradation
10. Smooth painting	Texture painting

Domination of color style under drawing style means that the number of features referring to drawing style (n_l) more then the number of parameters, referring to color style (n_r).

In our investigations with Vladimir Petrov, 240 artists (both Western European and Russian) from the fifteenth to the twentieth centuries were studied. Each artist may be characterized by "index of asymmetry":

$$K=\frac{n_r-n_l}{n_r+n_l}$$

This index changes from +1 ("pure" drawing style) to -1 ("pure" color style).

Twenty-two experts defined the stylistic features of the artists thrugh the use of these 10 paremeter.

These date were used in a large-scale investigation concerning evolution of Western-European and Russian scools of painting during 1430 - 1930 years from the point of view of two types of mentality. In order to facilitate the calculations, a database (DBase 111+) of the 240 artists and the average values for the parameters was created with the step t=3 yers.The resulting curve for "index of asymmetry" is shown on Figure 1.

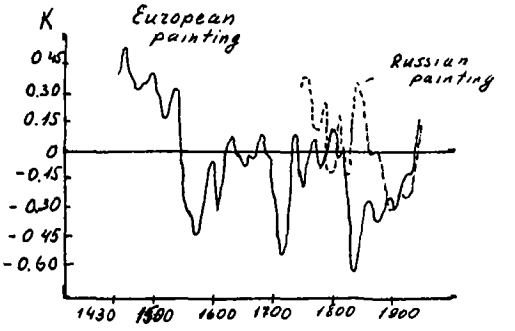

Fig.1 Cyclicity in painting evolution

Cyclic processes are typical in the evolution of art. The similar investigations was done for the evolution of music [2] and cyclicity was also obtained.

Mathematical description of this phenomenon can be based on the modification of equations for competitive interaction (Lottka-Volterra equations) as has been accomplished for the study of the interaction of three spheres of motion-picture culture: cinema, television and video [3], where cycles also take place.

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