SYMMETRY AND DYNAMISM IN SYSTEMS THEORY

Eufrosina OTLĂCAN[1]

Abstract. Study of geometrical symmetry, already appeared in ancient times, was continued later by algebra, with group theory and matrix calculus. Since the 19th century, various scientists, mathematicians, chemists, physicists, aestheticians, contributed with studies about symmetry and asymmetry, demonstrating the importance of the alternation symmetry/asymmetry for evolutionary processes.

Keywords: symmetry, asymmetry, orthosenses, dynamic symmetry, symmetric evolution

1. About the concept of symmetry in arts and science

Since millenaries the symmetry of figures was imposed in the aesthetic and pragmatic peoples concerns. The principle of symmetry has been introduced as a scientific concept in the VIth century B.C. by the Greek philosopher Anaximandre, related to the form of Earth and its position in Universe, this one being considered as having a radial symmetry. But the first systematic studies began in the 19th century, when the researches on crystals were been extended on the symmetrical polyhedrons. The study of geometric properties of symmetries is continued by algebra in the same 19th century with the group theory. C. Jordan's papers, published in the years 1868, 1869, and those of H. Hilton in 1903 were mentioned in this domain. In the 20th the algebra adds the instrument of matrix calculus; the papers of F. Seitz, published in 1934 and 1935, those of F. Fumi in 1947, are also quoted. In 1948 J. Burkhard applies the theory of the congruencies in the abstract study of symmetry [16].

Men created symmetry in their constructions because of the knowledge of geometric properties of the symmetry. But besides geometry and algebra, other branches of mathematics use the concept of symmetry; so, symmetry of function is an instrument of mathematical analysis, symmetrical operators *and, or, if and only if* belong to logics too, mathematical theory of fractals introduces the symmetry at scale, symmetry of fractals; mathematical linguistics takes into consideration the importance of symmetry in language.

In Romania the mathematical study of symmetry advanced under the leading of academician Gr. C. Moisil (1906-1973), especially studying the groups of symmetry in crystallography and the equations with partial derivatives of the phenomena.

---

[1] Prof. PhD., Romanian Committee for History of Science and Technology (CRIFST), Romanian Academy, Calea Victoriei 125, Bucharest, 010071, Romania