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The problem of ontogenetic realization of morphological heredity

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The modern molecular genetics based on the triplet genetic code looks as the most prosperous biological branch resting upon the strictly formulated physicochemical basis. However, the heredity of the morphological features harbors a logical inconsistency undermining the central theoretical basis of the molecular genetics. The inconsistency concerns the mechanism of ontogenetic realization of the species-specific morphological features that is displayed both in the course of the animal embryological development and during the plant up-growth expressed by the evolving morphology of leaves, fruits and perfectly refined flowers demonstrating puzzling geometrical exactness and symmetry. The main point is that the genetically determined species-specific morphology is realized by means of the spatial arrangement of multiplying cells constituting the developing part that is expressed by its morphological contours characterized by a particular geometric curvature. However, very often the geometrically perfect species-specific morphological curvature evident on the macro-level does not coincide with the corresponding picture displayed on the microscopic level, which demonstrates a less spatially organized (sometimes chaotic) arrangement of the cells as elements constituting the developing geometrically perfect curvature displayed on the macro-level. Moreover, in the case of a rough disturbance of the "normal" development (either naturally occurring or experimentally performed), the formation of the morphological pattern is, nevertheless, realized although by quite different (from the "normal") ways, leading finally to the same genetically determined geometrically precise species-specific macro-morphology. Consequently, the evident question is how the information coded on the genomic level is realized by means of the spatial arrangement of the cells constituting the genetically determined morphological feature, e.g., the form of a fish fin or a bird wing or a reptilian tail as well as the geometrical refinement of plant flowers, leaves, fruits, etc. Then, the problem of realization of the coding potential of a gene responsible for a certain morphological feature is a version of a more general question: How could a gene, as an intracellular agent of chemical nature carry out any morphogenetic activity involving spatial arrangement of the respective cells' community? The point is that the DNA nucleotide sequence perfectly codes the species specificity of the respective proteins (the chemical specificity) but how the synthesized protein "building blocks" determine curvature of the species-specific geometrical form of a developing tadpole or a growing pumpkin (the morphological specificity) remains inconceivable. The primary divergence between both the levels lies in that any chemical process is grounded on the chaotic movements-based inter-molecular interactions, while any morphological process is realized via inter-cellular spatial arrangement. Therefore, the gene as a chemically characterized agent cannot in principle be responsible for realization of the genetically encoded morphological indication, unless an additional non-chemical factor is proclaimed. Such an additional factor must operate on the basis of the vector-grounded mode of action and the suggested here supposition is based on the field principle, which is expressed by the action-at-a-distance postulate and considered as antithesis to the gene notion as a chemical concept. The main impediment is the nature of the field to be suggested. The theory proposed here is based on the theory of biological field by Alexander Gurwitsch (1944) who was the first to employ the field principle for analysis of living processes (1912).

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